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Metal Products and Metal Finishing Codes Now in Force

Codes Have Been Approved for the Copper and Brass Mill Products Industry and for the Fabricated Metal Products Manufacturing and Metal Finishing and Metal Coating Industry. Abstracts of These Codes.

THE Codes of Fair Competition for two of the most important branches of the metal industries were signed by the President, on November 2, 1933. These are: (1) Copper and Brass Mill Products and (2) Fabricated Metal Products and Metal Finishing and Metal Coating. Abstracts of these Codes, with the salient details are given below. Complete copies of the Codes can be obtained from the Superintendent of Documents, Washington, D. C. (Price 5 cents each).

Copper and Brass Mill Products

Wages and Hours

The following is a statement by General Johnson, Administrator, in his letter to the President, recommending approval.

"The Code provides for a 40-hour week and an 8-hour day, except as to outside salesmen, executive and supervisory staffs, with a further provision that watchmen and power-house employees may work 48 hours in any week. Any employee may work in excess of the maximum hours in case of emergencies, but in such event payment of time and one half for overtime is provided.

"Minimum wages are at the rate of 40 cents per hour for males and 35 cents for females, unless the hourly rate for the same class of work on July 15, 1929, was less than the respective minima, in which case the minimum rates are not to be less than the hourly rates on July 15, 1929, and in no event less than 35 cents for males and 30 cents for females.

"The minimum wages provided are guaranteed whether the employee is compensated on a time rate, piece rate, or salary basis.

"Child labor is prohibited. The continued employment of physically incapacitated employees and employers in clerical and laboratory work and messengers who may be under 18 years of age is permitted, provided the total number of both classes of employees does not exceed 5% of the total number of employees.

General Statement and Economic Report

"This is the copper and brass rolling mill industry, as more specifically covered by the definition in the code. The code was submitted by the Copper and Brass Mill Products Association, an organization including in its membership more than 95% of the production of the industry. As of July 31, 1933, it represented a capital investment of $152,000,000 and on that date the member firms employed approximately 24,000 persons.

"Pertinent data on employment, wages and hours, as submitted by the industry, is as follows:

	Number employed	Minimum wage rates	Average Hours of work
1928	25,915	39.7	50-55
1929	28,324	39.9	50-55
January 1933	18,782	32.4	38
August 15, 1933	23,782	38.1	42
Under Code at August 15, 1933 rate of operation	24,000	40.0	40

"Operation under substantially the provisions of the Code has resulted in the employment of approximately 5,000 additional employees since the first quarter of the year and an increase in the annual payroll of the industry of approximately $4,500,000 is anticipated as a result of the Code.

"The Executive Committee of the Copper and Brass Mill Products Association are set up as a planning and fair-practice agency to cooperate with the Administrator in the enforcement and administration of the code and all acts of the administrative group are made subject to the disapproval of the Administrator.

"Certain products produced by the industry are used both for electrical and other purposes, and a difference of opinion arose between the manufacturers involved as to whether these products should be subject to the electrical code rather than the code of this industry. The different firms interested have agreed that they will settle the question among themselves and no difficulty of administration is anticipated.

"I believe that the code is fair to Industry, to Labor, and to the Consumer, and in accordance with the intent and purpose of the National Industrial Recovery Act."

Other Points of Interest

Every manufacturer shall issue schedules of all his products, their prices, the quantity to which these prices apply and also his prices for scrap. Sales of products or purchases of scrap at prices other than those stated on the latest schedules are forbidden as unfair competition.

The practice of giving customers protection against advance in price and guarantee against decline in price is forbidden except in cases of sales to distributors, and sales under operations in connection with job contracts.

Among other unfair practices listed are the following:

Deviation from standard specifications to be established by the Association.

Lump sum bidding. All bids must show each item separately.

Imitation of competitors' trade marks and trade names.

False marking, labeling or misbranding.

False advertising—publication of untrue or deceptive assertions.

Commercial bribery—direct or indirect giving of money or anything of value to customers' agents or employees.

Defamation of competitors.

Fabricated Metal Products and Metal Finishing and Metal Coating Industries

Below is the statement by General Johnson, Administrator, in his letter to the President, recommending approval.

General Statement

"Before outlining in detail the provisions of this Code it seems appropriate to describe the industry and the problems involved, both for the industry and the Administration, in the development of this Code.

"In the broad field of metal working is included the manufacture of such articles as automobiles, electrical apparatus, machinery, farm implements, plumbing goods, ship building, etc.

"These large divisions of the metal working field have been well organized through trade associations or similar institutions; codes have been submitted and, in most cases, approved and are now operative.

"Beyond these larger units of the Industry are the manufacturers of thousands of articles, a few of which are kitchen utensils, wire goods, pressed and stamped metal parts, hardware, small tools, metal boxes, wood screws, roller and ice skates, chains, metal signs, pins of all kinds, cutlery, razor blades, vanity cases, and such items as animal traps, bird cages, and fly swatters.

"The need of a code of fair competition for the employers and employees of these smaller industries is as real and important as for the larger industries, and should receive equal consideration.

"The classification of these separate industries, presented a most serious and complicated problem. The many codes required to be submitted and given public hearings would involve great expense; and the time consumed would, to a considerable extent, tend to defeat the purposes of the National Industrial Recovery Act.

"The problem was complicated, further, by the fact that hundreds of manufacturers produced many diversified items. The application of separate codes for these different items, when produced in the same plant, would require the operation of a factory under varying wages and hour provisions of the separate codes, causing confusion and, in many cases, impossible operating conditions.

"The Administration was faced with the further problem of seeing that literally thousands of small shops, employing the same classes of labor, manufacturing specialties of one sort or another, were covered by a code. Generally these shops were not members of any trade group, nor were they grouped together in an agency for the preparation and submission of a code.

"On August 10, 1933, approximately 60 trade association representatives and many individual manufacturers met informally to discuss the problems involved. They were encouraged by the Administration to join together under some plan which would simplify these problems for the industry. At this meeting the Fabricated Metal Products Federation was formed and a basic code was prepared to cover the whole industry. This code contained uniform employment provisions and the opportunity for all well de-

fined and representative trade groups to submit supplemental codes to cover the trade practices of each subdivision and to create a Code Authority to administer such trade practices.

"The Fabricated Metal Products Federation proceeded at once to enlist the support of a truly representative number of trade associations and individual members. With 113 such trade associations and approximately 600 individual members, the Administration regards this result as truly representative of the industry, as defined in the Basic Code submitted herewith.

"The problem of definition likewise was serious. It was finally worked out to cover the broad metal working industries, specifically excluding however such basic branches of metal working as machinery, automobile parts and accessories, railway supplies and equipment, etc.

"A standardized form of supplementary code and a simple procedure for public hearings and the adoption of supplementary codes has been prepared, so that each branch of the industry may get the benefit of such fair trade practices in addition to those contained in the Basic Code as may be necessary for the benefit of its own branch, and the benefit of the individual administrative agencies set up to administer individual branches.

"In order to be sure that, insofar as possible, every one interested should receive notice of public hearing, individual notice of hearing was sent to over 7,700 concerns in addition to the standard form of notice. With each notice there was enclosed a copy of the code and a letter calling specific attention to the fact that the definition in the code as proposed would cover the operations of the manufacturer to whom the notice was addressed. Since it was impossible to determine in all cases the specific product manufactured by a particular firm, there were some instances of notice being sent to firms whose products were covered by other codes. These, however, constituted a relatively small number of the firms to whom notices were sent.

Wages and Hours

"A 40-hour week with a 40c. per hour wage for males and a 35c. per hour wage for females is established in the Northern Wage District, and a 35c. per hour wage for males and a 30c. per hour wage for females is established in the Southern Wage District.

"Because of the fact that this industry covers plants manufacturing countless varieties of products, located throughout all parts of the country, special provision is made with respect to female wage rates. Generally speaking, it is a light manufacturing industry, and probably twenty per cent of its employees are female, and it is estimated that a minimum wage differential of approximately ten cents heretofore has existed. It was felt advisable therefore to provide a wage differential between male and female workers, with a proviso that where female employees are used to replace male employees to perform certain classes of work, such female employees shall be payed the same rate of pay in effect for the male employees at the time of such replacement.

"It is estimated that eighty-five percent of the employees in the Industry are in the Northern Wage District. A fair adjustment for wages in the south was made by providing for the payment of the rates in existence for the same class of work on July 15, 1929, except that in no case are the minimum rates to be less than eighty percent of the standard minimum rates in the Southern District.

"Child labor is prohibited.

"Exceptions to the minimum hour and wage provisions are permitted in the case of beginners without experience for a sixty-day period, and in the case of disabled employees and boys and girls between the ages of 16 and 18 years. These exceptions are limited to approximately five percent of the total number of employees and are to receive not less than eighty percent of the minimum wages.

"Payment of time and one half is provided in all cases where hours of labor exceed those for which provision has been made.

Economic Effect of the Code

"Because of the short time available, and because of the fact that, except in specific trade groups, the industry was not organized, it was impossible to present accurate data from all plants as to the effect of this code on this industry. In general, however, it is well to point out that in normal times this industry operated on schedules of from 50 to 55 hours a week. I believe, with the adoption of the 40-hour week as provided in the code, there will be an increase in the number of persons employed, on the same basis of activity, of approximately twenty-five percent.

"The industry estimated, using as its basis the United States Census of Manufacturers and Bureau of Labor Statistics, that during the period from 1926 to 1929 there were normally employed 350,000 employees. The Federation which is sponsoring the code estimated that there are at present 313,752 employees in the industry, an increase of approximately 109,237 since the first quarter of the year.

"An analysis of some sixty representative concerns shows that the number of employees has been increased by 53 percent since the first of the year, and that the average wage rate for unskilled workers, to whom the minimum rates apply, have been increased 16½%.

"The minimum rates per hour have been increased nearly to the rates for unskilled labor in 1926, and under the code will be further increased to the 1926 rates, or higher. The total weekly pay rolls of these 60 representative concerns, including equitable adjustments of wages above the minimum, have since April 1, 1933, been increased 98.9 percent, from $152.-613 to $303,546.

"The average hours worked in these 60 representative concerns have been reduced 5.7 percent since July 1, 1933, and under the code will be reduced another 3 percent at least. Under a maximum 40-hour week it is estimated that the reduction in hours will amount to approximately 10 percent less than such maximum. If the rate of production in evidence October 1, 1933, continues, it is estimated that the code provision will result in a further increase in the number of employees of approximately 11 percent.

"In the administration of the code the Fabricated Metal Products Federation is set up as the Code Authority, to collect such data and statistics as are required by the Administrator, and provision is made for the Code Authorities in supplementary codes, wherever possible, to collect and compile this data for transmission to the Federation.

"All action taken by the Administrative agency is made subject to the disapproval of the Administrator.

"I believe that this code accomplishes the following:

"1. It covers the operations of several thousand small metal working firms, who might otherwise not be included in any code of fair competition submitted to the Administration;

"2. It materially reduces the normal hours of operation for employees in the industry;

"3. It sets a fair minimum basic wage rate with equitable adjustments provided for those receiving higher wages, which will result in material wage increases in the industry;

"4. It sets up uniform wage and hour conditions over this broad industry, simplifying the problems of the manufacturer and at the same time permitting him to obtain the benefits of the National Industrial Recovery Act; and

"5. It eliminates a tremendous amount of detail work and expense which would be involved in conducting several hundred public hearings on separate codes.

"I believe that the code is fair to Industry, to Labor, and to the Consumer, and in accordance with the intent and purpose of the National Industrial Recovery Act."

Other Points of Interest

Equitable adjustments to maintain differentials existing as of May 1, 1933, in all pay schedules of factory employees (and other employees receiving less than $35.00 per week) above the minimums, shall be made on or before fifteen days subsequent to the effective date of this code (November 12, 1933).

The following acts are among those described as unfair methods of competition:

The selling of any product below reasonable cost. All methods used to determine such costs are subject to approval of the Administration. Certain exceptions are made to allow for conversion of dropped lines, seconds or inventories into cash to meet emergencies, etc.

The allowance of secret rebates, refunds, credits, unearned discounts or other privileges, not extended to all purchasers under like conditions.

Defaming or disparaging a competitor.

Imitating a competitor's trade mark, package, label, etc.

Bribing the agents or employees of customers.

False marking or branding of any product.

Mis-statements in advertising or otherwise about the grade, quality, quantity, nature, size, finish, etc. of the product.

This code is intended to be a basic code and to cover the entire industry. However, trade associations and groups of manufacturers representing a substantial part of any specific sub-division of this industry may formulate supplementary codes with such regulations as are considered advisable by them. All employment provisions, however, must conform to the basic code.

British Research Programs

We are in receipt of communications regarding the article published in our October issue, page 344, on British Research Programs, with the following corrections and additional information.

The International Tin Research and Development Council, under the Chairmanship of Sir John Campbell, with offices at Manfield House, 378 Strand, London, W. C. 2, has undertaken an international program for research in tin. The Council is composed of official delegates appointed by the governments of Malaya, Dutch East Indies, Bolivia and Nigeria, and these governments have underwritten a fund for the support of the work.

The Council was organized approximately eighteen months ago and in August 1932 D. J. Macnaughtan was appointed Director of Research. A number of research investigations have been instituted in England, Germany, France and Holland, and Mr Macnaughtan is at the present time in the United States for the purpose of expanding the operations of the international program and instituting additional research investigations in the United States.

The Council was organized and the research program undertaken because of the need for improved scientific and technical data relating to the industrial applications of tin. It is intended that the results of investigations shall be made available to consumers of tin without cost to them.

The Copper Development Association is supported by most of the principal copper producers, all the trade associations and some of the biggest individual fabricating firms in the British copper industry. The headquarters of the Copper Development Association are at Thames House, Millbank, London. S. W. 1, England.

Chromium Plating Patent Lawsuit

During the latter part of September and the early part of October, hearings were held in the case of United Chromium, Inc., versus the Bassick Company, Bridgeport, Conn., the General Motors Company of Detroit and its subsidiary, the New Departure Manufacturing Company of Bristol, Conn., in the United States District Court of Hartford, Conn., before Judge Edwin H. Thomas. The plaintiff, United Chromium, claimed infringement of the Fink patents. After three weeks' session, the case was adjourned until January 18, 1934, at which time the plaintiff must have his brief filed. The defending companies have been given until February 21, 1934, for their replies. The final oral arguments must be made by March 15, 1934, some time after which decision will be rendered.

Some time ago United Chromium was the victor in a suit against the International Silver Company, Meriden, Conn., in the same court, and the Circuit Court of Appeals confirmed the decision. These decisions were reprinted in full in the METAL INDUSTRY for November, 1931, pages 465-8; September, 1932, pages 355-8; December, 1932, page 474; February, 1933, page 60.

Prevention of Silicosis

According to a report in the daily press, Dr. F. G. Banting has invented a device to free air of particles of silica, thus preventing the disease of silicosis, which is the result of inhaling these small particles into the lungs. The device is intended primarily for use in metal mining, but it may prove to be very useful in industrial plants, such as foundries. It was developed under the auspices of the Industrial Hygiene Division, Ontario Department of Health, Toronto, Ont., Canada.

The Part Played by Non-Ferrous Metals At Century of Progress Exposition

By R. G. KING

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Metals and Metal Finishes Were an Indispensable Factor of the Fair

EVEN though the story of non-ferrous metals is not told in any unified exhibit by the industry at A Century of Progress Exposition, which recently closed in Chicago, to re-open next year, there is scarcely a single division in the entire Fair in which these metals, or products utilizing them, do not play an important part. This means much to those in the industry who visit the Exposition. It means even more to the twenty-two million visitors who attended, most of whom were unaware of the importance of the non-ferrous metals and the many new uses to which they are being put and of which they learned through these exhibits which constituted a priceless medium of national publicity for the non-ferrous trades.

One important branch of the industry did, however, stage a unified exhibit. This was the Copper and Brass Research Association, whose display in the Mineral Industries Building, showed the development of the copper and brass industry in the past hundred years. Ancient samples of useful copper articles emphasized the enduring qualities of this material and, in particular, the fact that copper pipes will last for thousands of years. The average man today, the exhibits illustrate, can build with finer copper and brass materials than were available to Croesus or Solomon. Aluminum was also shown in the displays.

Individual exhibits in various buildings were arranged by the American Brass Company, the Aluminum Company of America, and the International Nickel Company.

Metal Work and Finishes

HARDLY an industrial exhibit, yet this replica of the Golden Temple of Jehol at A Century of Progress represented some unusual metal working and finishing. It had a copper roof which was covered with gold leaf, and lacquer was extensively used to decorate it. Within it were displayed many bronze and other metal works of Chinese origin.

The replica was made in North China, by native architects and craftsmen, and shipped to Chicago in 28,000 pieces. It was the gift of Vincent Bendix, automotive magnate.

The fundamental theme of the Exposition was that industrial progress in the past century has been due chiefly to work in the pure or basic sciences. At the suggestion of the Science Advisory Committee of the National Research Council, which assisted in the development of exhibits, Exposition officials created a Basic Science Division. Dr. Henry Crew, professor of physics at Northwestern University, was chief of the division which included chemistry, biology, geology, mathematics, physics, astronomy, and the medical sciences, with a section head responsible for the exhibits of each. A magnificent hall on the main floor of the Hall of Science was set aside for these important displays.

Chemistry was presented to Exposition visitors as the fundamental science of the transformation of matter. In these exhibits the layman observed examples of the rusting of metals, as well as the development of the world's raw materials and their production by means of chemical transformation into articles and commodities of vital necessity to mankind. Special exercises were held on June 28 which was set aside by Dr. I. E. Muskat, head of the chemistry section, as Faraday Day.

The vital importance of gold and platinum in the industrial field, as well as for jewelry, was developed by Baker & Company, Inc., Newark, N. J. The display included platinum gauze which converts ammonia into nitric acid; the spinnerettes made of platinum-gold alloy by means of which cotton and wood pulp are changed into rayon fabrics; platinum alloys, applied to dentistry, and other metals.

The part the non-ferrous metals play in travel was graphically illustrated in the Travel and Transport building by giant aluminum airplanes capable of 400 miles per hour, two aluminum Pullmans, and by high speed automobiles. Automobile manufacturers exhibiting comprised General Motors, Chrysler and Nash, who have buildings of their own, and Packard, Studebaker and Cord and subsidiary companies. International Harvester Company has its own building. Trucks were also displayed by the Walker Vehicle Company and the Clark Tructractor Company. Accessory and parts manufacturers included Alemite, The Electric Storage Battery Company, Borg-Warner, and Stewart-Warner.

An outstanding exhibit was the featherweight aluminum globe of Prof. Auguste Piccard, in which he flew 53,000 feet into the stratosphere. This was a loan from the National Foundation for Research of Belgium, and was suspended from the ceiling of the Hall of Science.

Although aluminum and other non-ferrous materials were not included in the materials used for construction of the Exposition group of experimental houses, they were employed within both as decorative trimming and as part of the furnishings. Pipes and electric conduits were made part of the decorative scheme in several of the houses by the utilization of chromium plate. Metal furniture was found in most of the houses, especially on the roof terraces. Kitchen cabinets with chromium plate and Monel metal sinks were introduced. In one house, fireplace and mantel were chromium plated and the terrace furniture was of hand-wrought aluminum. In another the fireplace was aluminum in a semi-lustrous finish, the design having been obtained by four highly polished strips of the same metal. Since this is made from a single sheet of aluminum the cost is not prohibitive. In the same house a thin copper sheeting (Merimet), colored to a deep chocolate tone, was used on curved portions of the wall where its lustre gave it unusual decorative quality in addition to high fireproofing value. Employment of this sheeting is made possible by a new process which enables metals to be welded to fabric, wood, leather, or similar substances. Copper also occupied an important place in the furnishings of these experimental homes. Copper lamps and a copper aquarium were featured in one upstairs study, while copper shades were used with the lighting fixtures in another house.

Home Planning Hall, the general exhibits feature of the housing section of the Exposition, was placed in the heart of the group. Supplementing these housing exhibits, its displays were devoted to heating, plumbing, air conditioning, refrigeration, home equipment, and the decorative and industrial arts.

Among the outstanding special buildings was the replica of the Golden Temple of Jehol, faithfully reproduced by Chinese artists and artisans. The roof, 70 feet square, was covered with copper shingles and these were overlaid with $25,000 worth of pure gold. Exposition newspaper publicity emphasized the fact that when one of the Exposition staff remarked that it seemed too bad to have that amount of gold wasted by exposure to the weather, Dr. Woo, curator of the exhibit, replied:

"One hundred and fifty years from now that roof will be in better shape than it is today."

The fact that this might be said of buildings and objects employing almost any of the non-ferrous metals was a thought which a tour of the Exposition doubtless impressed upon many of the millions of visitors.

Among manufacturers, not heretofore mentioned, whose exhibits included products utilizing non-ferrous metals were the following:

Addressograph Multigraph Corporation, Altorfer Brothers, American Stove Company, Birtman Electric Company, Burroughs Adding Machine Company, Chicago Flexible Shaft Company, The Conover Company, Continental Scale Works, Crane Company, A. B. Dick Company, Dictaphone Sales Corporation, Elgin National Watch Company, Frigidaire Corporation, Walker Dishwasher Company, The Hammond Clock Company, Hess Warming & Ventilating Company, Holland Furnace Company, International Business Machines Corporation, Kelvinator Corporation, National Cash Register Company, Norge Corporation, Radio Corporation of America, Servel Sales, Inc., Singer Manufacturing Company, The Wahl Company, Westinghouse Electric & Manufacturing Company, The Bryant Heater & Manufacturing Company, Kohler Company, Edison General Electric Appliance Company, Timken Silent Automatic Company, Elgin Stove & Oven Company, General Electric Company, Crane Company, Standard Sanitary Manufacturing Company, Electrolux, International Silver Company, Oneida Community, Ltd.

One of the outstanding facts of the Exposition was its universally good financial record. According to reports in the daily press the revenue was about $35,000,000. Subscribers to the $10,000,000 bond loan which financed the Fair have so far gotten back 50 cents on the dollar. This is said to be five times the normal reimbursement in previous ventures.

The Exposition is scheduled to re-open June 1, 1934.

Specifications for Hose Couplings

Specifications have been issued by the Federal Specifications Board for water suction hose couplings with the request for comments and criticisms to be in their hands not later than January 12. Copies for detailed study can be obtained from the Federal Specifications Board, Bureau of Standards, Washington, D. C. Some of the specifications are as follows:

All parts except expansion rings shall be of copper (minimum) 83; tin 5; zinc (maximum) 7; lead 3. Expansion rings shall be made from seamless tubing conforming to either of the compositions prescribed below:

Copper	Tin (max.)	Zinc	Lead (max.)	Iron (max.)
79-86%	—	remainder	0.20%	0.05%
59-68%	1.5%	remainder	3.50%	0.20%

All parts of couplings and clamps shall contain not less than 68% copper.

Soldering Copper to Aluminum

Q.—Please let me know how to solder thin tinned copper strip to aluminum foil?

A.—To make a strong and durable joint, it will be necessary probably to use a coating of aluminum solder on the foil. Then place the parts together and apply heat for a few seconds, either by a soldering copper bit—gas heating or electric—to sweat the tinned coatings together. The aluminum solders are fluxed, but may require rubbing or scratching the aluminum under the melted solder so as to make the solder bite under the oxide film.

It must be remembered that aluminum and copper make a battery combination and that where the joints are subjected to weather or marine conditions, the joints may deteriorate. For very important work, electroplating soldered joints might be advisable.

W. B. F.

Electroplating Generators

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A Series of Articles on the "Cornerstone of the Plating Plant"—Part 6*

Commutator Design

THE design of a commutator for low voltage high amperage generators follows certain fundamental principles which years of experience and careful observation have revealed as reliable and trustworthy.

Factors affecting commutation such as correct design of main poles, commutating poles, airgap, proper relation between electric and magnetic loading etc., which do not depend essentially on the design of the commutator proper and its accessories, brushes and brush holders will not be considered here; the assumption being that these parts of the generator are correctly designed.

An allowance of ten amperes per square inch of commutator rubbing surface is fair and conservative.

A commutator diameter sixty percent of the armature diameter will not only harmonize in appearance but also fulfill the requirements of the rules discussed later on.

Selecting in the example given in the preceding paper a conservative output midway between 10,000 amperes and 12,500 amperes, a commutator surface of 1,125 square inches will be required at ten amperes per square inch.

The armature diameter is 40″, sixty percent is 24″ the periphery of which is 75.5″ and a commutator length of 15″ gives a rubbing surface of 1,130 square inches.

The generator having sixteen poles, each commutator will have sixteen rows of brushes, eight positive and eight negative; each row will commutate 625 amperes at an output of 10,000 amperes; 782 amperes at an output of 12,500 amperes.

The commutator having 80 bars and a periphery of 75.5″ the bar pitch will be .9425″ limiting the thickness of the brush to .750″ or at the most to .875″ to prevent the brush touching more than two segments at any one time and retaining a standard thickness.

Other very important reasons the consideration of which is not within the scope of this article make the lower value preferable.

With 15″ axial length no difficulty will be experienced in disposing of 10″ length of brushes in each row leaving 5″ to accomodate the brush holder sides, staggering, oscillation of the armature and clearances.

With 10″ total length of all the brushes in one row, .750″ thick the total cross section of one row will be 7.5 square inches and the density when that row collects 625 amperes will be 83.3 amperes per square inch.

The number of amperes per square inch of brush area is not only a meaningless, but becomes a misleading expression, unless the thickness of the brush is taken into account and that thickness should always be less than the width of a segment when the commutating pole influence is exerted on only one coil as is almost invariably the case in low voltage generators having a large ampere output.

A practical demonstration of the fallacy of attaching too much importance to the ampere density in the brushes is easily carried out as follows:

With a load of 10,000 amperes on the generator the brush density will be 83.3 amperes per square inch when the brushes are .750″ thick with an aggregate length of 10″ per row and the generator will commutate satisfactorily at 15,000 amperes when the brush density will be 125 amperes per square inch.

If the contact area is reduced 33-1/3% by removing to a depth of 1/16″ an eighth of an inch from the front and the back of the brush reducing its arc of contact with the commutator from .750″ to .500″ the same loads will be carried as before the commutation being at least as good in spite of the fact that now the density is 125 amperes per square inch with an output of 10,000 amperes and 187.5 amperes per square inch with an output of 15,000 amperes.

Nor does the heating of the brushes or the commutator increase under these conditions.

If the brush holders are replaced to accommodate brushes of the same grade of material but 1-1/2″ thick the aggregate length per row remaining 10″ the brush contact area will be 15 square inches, twice what it was with brushes .750″ thick; consequently the brush contact ampere density is lowered to one half of what it was with brushes having a thickness of only .750″ and to one third of the density when the arc of contact was only .500″: nevertheless commutation difficulties appear, also a very obvious rise in temperature.

Indeed the commutation is poor at any load; nor are conditions improved if we reduce the aggregate axial length from 10″ to 5″ so as to restore the original ampere brush density; but the performance with these thick brushes will be improved by selecting for their composition a material having a comparatively high contact drop and a high resistance.

When the brush is too thick either the leading or the trailing tip or both are outside of the commutating zone therefore there is a difference of potential between the leading and the trailing tip; the lower the contact drop and specific brush resistance the larger is the parasitic current for a given potential and that potential increases with the thickness of the brush.

That is the reason why two undesirable properties in a brush namely, high contact drop and high resistance, become necessary to overcome a greater evil.

The property of a brush having a high contact drop and high resistance to improve commutation is an old discovery which is depended upon even to-day to secure fair commutation from improperly designed machines on which the better quality brushes can not

*Parts 1 to 5 were published in our issues for June, July, August, September and October, 1933.

be used on account of sparking; it is a palliative: the cure would be to remove the cause which the designer evidently does not know.

The results of curing the ill effects of a brush too thick by using a brush having a high contact drop and high resistance are as follows:

1. To increase the contact drop loss.
2. To increase the brush resistance loss.
3. To increase the friction practically in inverse ratio with the reduction of the ampere density.

Of these the first is generally the greatest and most important.

The losses are increased; but the parasitic current being reduced to a greater or less extent the machine operates apparently well and if the commutator is hot, what of it? The owner has what he wanted: a generator that has a low ampere density per square inch of brush contact.

Two 7500 ampere 6 volt 300 rpm. generators built by two different manufacturers were installed in the same plant. The commutators of each machine were constructed of hard drawn copper, they had the same number of bars, same diameter, same axial length; but were equipped with different styles of brushholders: one by bringing the brushes at an angle allowed a greater arc of contact and therefore a lower ampere density per square inch of contact. One generator showed a commutator temperature rise of 60 degrees centigrade after six hours run with 7500 amperes at 6 volts. The other generator's commutators showed a temperature rise of 28-1/2 degrees centigrade after 10-1/2 hours run with 9375 amperes at 6 volts. Apparently the commutation in both machines was excellent; but there was a marked difference in the efficiency of the two machines, their regulation and other desirable characteristics.

The next article will be a continuation of the same subject, including facts about brushes.

The Electric Refining of Mercury

By E. Newberry and S. M. Naude*

A method for the electrolytic purification of mercury is described, in which a mercurous perchlorate electrolyte is used with a cathode of pure mercury, an e. m. f. of 0.5 volt, and a current density of about 1 amp./dm.^{2} Two types of apparatus are described for use with and without mechanical stirring respectively. The chief difficulty encountered lies in the formation of crusts of solid salt over the exposed surface of the anode. Spectroscopic examination of the product indicates that a high standard of purity is obtained by this process.

Electrodeposition of Iron-Copper-Nickel Alloys

Part III: Deposition from Sulfate-boro-citrate Baths

By Lawrence E. Stout and Charles L. Faust*

Ternary alloys of copper, nickel and iron may be deposited from alkaline sulfate solutions containing ammonium boro-citrate. The boro-citrate overcomes the difficulty caused by the chemical reduction of the copper content of the solutions. The current density range for good deposits is from 0.5 to 2.0 amp./dm.^{2}

The Adhesion of Electrodeposited Coatings to Steel

By A. W. Hothersall*

The nature of adhesion of electrodeposited coatings to metals is briefly discussed and the causes of poor adhesion are reviewed in more detail, with particular reference to the case of nickel deposits on steel surfaces. The principal causes of poor adhesion are considered to be (1) a surface layer of the basis metal which is initially weak or which is embrittled by co-deposited hydrogen, (2) the presence on the metal surface when deposition commences of a film of oxide, greasy or adsorbed colloidal matter, or of insoluble matter such as carbon or carbides liberated during etching, (3) a layer of defective deposit formed in the early stages of deposition. Examples of tests for adhesion and of typical quantitative results showing the high degree of adhesion of electrodeposited nickel which may be obtained to a variety of basis metals, are given.

*A paper presented at the Sixty-fourth General Meeting of The Electrochemical Society held at Chicago, Ill., September 7, 8 and 9, 1933. For other papers see Metal Industry for October, 1933, page 341-2.

Melting Silver

Q.—Can you tell us what we might use as a flux for melting sponge silver?

Also with what might we paint our ingot molds so that the silver will not stick to them?

A.—When you say "sponge" silver, do you refer to the fine grayish silver powder, such as is secured when reducing silver chloride to metallic silver by means of zinc and an acid solution? Most people call this "cement" silver. The particles are small, but each one consists simply of silver metal—not silver chloride, for instance, but true silver. It is called cement silver because of its appearance. We assume that that is what you refer to.

When melting this silver powder, use plenty of powdered borax glass, or boric acid crystals. The boric acid crystals are less expensive, and work just as well. It is important to use enough of the flux to cover the metal thickly; usually more will be added as the melt goes down. The older books advise the use of charcoal here, and naturally it does no harm, but if plenty of flux is used, charcoal is quite unnecessary. Do NOT use any sal-ammoniac or table salt.

In the melting of silver, the following are the important points:

1. To pour at the right temperature; this is the hardest thing for the beginner to master.
2. To have the melt deeply covered with flux, to prevent the absorption of gases.
3. To pour quickly, not letting the stream of molten silver break up as it falls. Naturally, the purity of the metal is important too.

A popular material for greasing the ingot molds is the so-called cutting oil sold in plumbers' shops for use when cutting threads on iron pipe. Any clean mineral oil of good body, suitable for high grade machinery, will serve. Some melters smoke the mold, using a smoky flame, but it is less trouble to use a grease or heavy oil.—Jewelry Metallurgist.

Rotary Grinding Before Plating

How Rotary Grinding Reduces Costs in Preparing Steel Bed Plates for Nickel and Chromium Plating

By FRANCIS A. WESTBROOK

Mechanical Engineer

GRINDING the surfaces of bed plates by means of rotary surface grinding machines to prepare them for nickel or chromium plating has, in at least one plant, reduced costs by the impressive figure of 85 to 90%. It is the installation and use of such equipment as this that is contemplated when the subject of modernization is under discussion, and it is not hard to see that any concern which makes use of the many potential possibilities of this kind which are available is going to survive the depression in much better condition, and will be in a much better position to take advantage when the upturn gets under way, than those enterprises which clamp down on all expenditures.

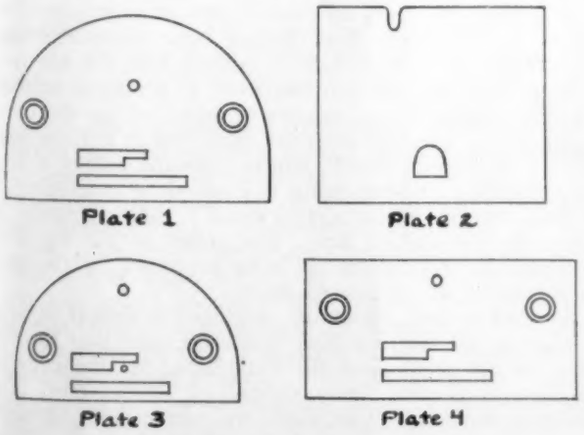
The machines for doing this work were installed to replace a number of old fashioned and cumbersome polishing machines which took a great deal more floor space. With the new equipment it has been possible to secure square, sharp edges and a flat surface having a finish which gives excellent results. With the old machines there were frequently deep scratches from the emery wheels which caused some 30% in rejections and was pure waste. This has been practically eliminated.

Naturally in using a magnetic chuck for holding, some residue magnetism will be left and this should be removed before plating. This is done in a hollow coil demagnetizer in which the pieces are placed as soon as ground and while waiting to be loaded for transportation to the plating baths, so that no time is lost for the demagnetizing operation.

Production data are available for four plates shown in the diagrams. The material is soft cold rolled steel as received from the rolling mill and approximately .004 inches of material is removed from one side. The finished surface is such that only a final hand buffing is required. Grinding is done on a rotary surface grinder equipped with a special 24 inch fine mesh magnetic chuck with a retainer ring. Hence the need of demagnetizing after grinding. The average rates of production for the four plates, according to the experience of one concern is as follows:

Plate No. 1	.....	300	per hour
" " 2	.....	320	" "
" " 3	.....	450	" "
" " 4	.....	305	" "

Grinding Needle Guards at Singer Sewing Machine Company



Four Types of Plates Surfaced

Cutting Fluids for Metal

In Progress Report No. 5 of the Sub-Committee on Cutting Fluids of the American Society for Mechanical Engineers Special Research Committee on the Cutting of Metals, a description is given of a series of tests which was run to determine the influence of cutting time of 11 cutting fluids when sawing each of 8 different metals with high speed steel blades. Among these metals were a cast aluminum alloy (S. A. E. 33) and rolled leaded free cutting brass.

The time for the first cut in each metal was low and varied most from the average of the three cuts. This was particularly true for the brass. The cutting fluids had the least effect on the aluminum and the brass, and the most effects on the steels.

Cleaning and Re-sharpening Files

By A. EYLES

Mechanical Engineer, Manchester, England

EVERYONE at some time or other has encountered difficulties due to clogging of file teeth when filing soft metal, especially aluminum, solder or zinc. The following gives ways of cleaning clogged files.

Removing Various Metals

When aluminum or aluminum alloys are the metals to be removed, the files should be immersed in a strong solution of caustic soda for a few minutes, after which the chips or particles can easily be brushed off. To prevent rusting after this treatment, wash in clean cold water and dry in warm sawdust. Sand-blasting is another good method of cleaning files clogged with aluminum or its alloys.

If files are clogged with brass, bronze, copper or zinc, first immerse them in a strong solution of caustic soda, rinse in water and dry quickly. Next, immerse the files for a few minutes in a solution consisting of nitric acid, 1 gallon; hydrochloric (muriatic) acid ½ gallon; water, 2 gallons. To prevent rusting through acid treatment, the files should be immersed in a caustic soda solution, well rinsed in running water, and dried in warm sawdust; afterwards wiping thoroughly with oil.

If the file teeth are clogged with babbitt, solder, or lead, the files should be immersed in a strong (boiling) solution of caustic soda, rinsed in water and brushed with a stiff steel-bristled brush or file card.

If the files are greasy it will be advisable first to boil them for a few minutes in very strong soda solution to dissolve the grease before immersion in the acid solutions. Mild alkaline commercial cleaners, 4 to 6 ounces per gallon of water, may also be satisfactorily used for removing grease or oil prior to immersion of the files in the acid bath.

Paint, red or white lead, and substances of a similar nature can be removed from the file teeth by leaving the files in a tank containing kerosene for several hours, and then washing them thoroughly in very hot soda solution, brushing with a steel-bristled brush or file card. Solid lumps often have to be picked out by a sharp-pointed steel tool, such as a steel scriber. Apply more oil and finally give the files another wash and brushing.

A simple and efficient file tooth cleaner can be made from a ⅜ in. brass or copper rod about 6 in. long. Hammer one end out to the shape of a putty knife, and the other end like the tag end of a file for a wood handle. Hold in the left hand the handle of the file to be cleaned, and place the other end against a firm support. Then push the file cleaner along the grooves across the file. After being pushed across a few times the teeth of the file make grooves in the tool corresponding to the shape of the sides of the teeth. With this tool pieces of soft metal and dirt are in most cases quickly removed from the grooves.

Re-Sharpening Files

There are several processes for re-sharpening files by the use of acid solutions. A number of patents have been filed covering certain methods of re-sharpening files by such means, but most of these patents have expired. The writer has tested files sharpened by etching with acid solutions, and in most cases has found that they gave very good results. Of course, the acid must not be permitted to attack the files unduly. To prevent this, it is advisable to make a few tests or trials to determine the length of time the files should be immersed in order to obtain the desired results, before proceeding with the re-sharpening of files on a quantity basis. The methods outlined hereunder are among those most generally employed.

(1) First clean the files by immersing them in a strong solution of caustic soda and boiling water for a period of from five to ten minutes. After the cleansing treatment, the files are placed in an acid bath. This bath is made by adding twelve parts water to a solution consisting of one part nitric acid, one part fuming sulphuric acid, and one-third part concentrated sulphuric acid. These parts are measured by volume and not by weight. The files, when placed in the acid solution should not overlap, and should be arranged so that the solution will reach all surfaces. It is preferable first to suspend the files in the tank and then add the acid solution. The files should be allowed to remain in the solution from ten to fifteen minutes, the exact time being determined by experiment.

Another process consists of immersing the files in a warm aqueous solution of nitric acid and hydrochloric acid, consisting preferably of about equal parts of the acids and of water. This solution should be kept at a constant temperature. After the files have been treated with the acid solution they should be washed in lime water or some other alkaline solution, and then wiped with oil.

A third method is to submerge the files in a solution consisting of nitric acid, ½ gallon, hydrochloric acid, 1 quart, and water, 3 gallons. In order to prevent the files from rusting when treated in this solution, they must be transferred quickly to a strong solution of caustic soda, rinsed thoroughly, dried quickly and wiped with oil.

A process in which an electric current is employed requires the files to be first cleaned by a nitric acid solution. Following this, chalk is rubbed into the file teeth grooves and the files are immersed in a copper sulphate solution until a film of copper is deposited on the crests of the teeth. The files are next immersed in a dilute solution of mercurous nitrate, which gives the copper a mercury coating. Re-sharpening is effected by employing an electric current in connection with a dilute solution of nitric or hydrochloric acid. The crests of the file teeth subjected to this treatment being protected by the mercury coating, are not acted upon.

Another method sometimes employed is similar in some respects to the electroplating process, except that the files serve as the anode and the tank lining as the cathode, the current flowing from instead of to the files. The lining of the tank is lead sheet, the bottom being covered with an insulating material to reduce the area of the exposed surface of the cathode. The negative terminal

of the dynamo used for plating is connected to the lead lining of the tank, and a brass bar extending across the receptacle and insulated from it is connected to the positive terminal of the dynamo. The acid solution employed is composed of sulphuric acid and water in the proportion of one part acid to five parts water. The current used ranges from three to five volts and the time required for the operation is about 30 minutes. The files are suspended vertically from the brass anode bar by means of wire clips, so arranged that the files are submerged in the acid up to the base of the file proper. The files must be free from oil or grease before they are immersed in the acid solution. To remove the grease or oil, they should be boiled in a strong solution of caustic soda and then subjected to a thorough washing in water, to make certain that no alkali remains on them before they are suspended in the tank.

In order to prevent the files from rusting after they have been re-sharpened they are thoroughly rinsed in running water and then suspended in boiling water containing a small quantity of sal soda. They are left in the tank until they are heated through, after which they are removed and allowed to dry. A protective coating is finally given the files by rubbing them with an oily cloth.

A word of caution is necessary in conclusion: Always pour the acid into the water slowly; never pour water on the acid (sulphuric), as an explosion may result. The acid solution tanks should be kept outside the shops containing machinery, otherwise the fumes will rust all steel parts within range.

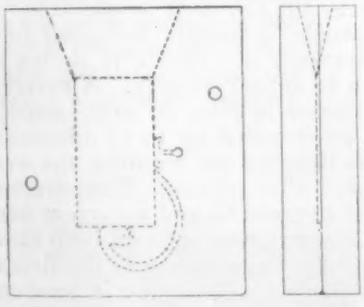
Permanent Mold Casting

Q.—We would like information concerning the usual procedure in using iron chills and permanent molds in brass foundry practice. Our especial interest lies in casting a flat design the thickness of which is about 1/16 inch.

We have had experience in casting thin sections in our regular work, but have never used iron permanent molds because the quantity of any one type of casting did not make it economical to make or have the iron molds made.

A.—The usual method of casting brass and aluminum and white metal of this class is in permanent molds made of cast iron or sometimes in carbon molds. It all depends upon the style and design of the casting to be made.

Yellow brass containing ½% aluminum can be cast in carbon molds but is not successfully cast in iron



Method of Gating a Flat Casting

molds. Metals that cast best in iron molds are aluminum-bronze (containing from 5 to 10% of aluminum, balance copper) or aluminum or white metal. And should be made as per sketch for casting similar to your description of the casting you desire.

We note your work has considerable lettering. That would make it difficult to cast in a thin section and get good results. We would not recommend permanent molds for this class of work. They could, however, be die cast in white metal or aluminum alloy when cast under pressure. We suggest that you consult some of the die casting manufacturers if white metal or aluminum would be satisfactory.

W. J. Reardon

Pickling Brass

Q.—We open-fire anneal 70/30 brass mixture at approximately 1100° F. After the wire has been withdrawn from the furnace it is quenched with water and we then put it in our regular sulphuric pickle to remove the black oxide, and finally give it a dip in a solution of approximately 7% sulphuric (by volume) and 3% potassium bichromate (by weight.) We are unable to completely remove the stains from this material by this method.

Could you suggest what cleaning procedure we should follow to regain the bright lustre that we desire? We handle this in commercial quantities of about 10,000 to 20,000 lbs. per day.

A.—Your problem as presented in your letter of May 10 does not make clear whether the wire does not pickle clean or whether the dark spots appear later. What generally happens in practice where the "high brass" alloys are treated as you describe, i. e., open fire anneal, pickle, wash, etc., is a tarnishing of the metal, dark spots, born of the difficulty of thoroughly drying the coils after the washing operation. Even a microscopic film of moisture, air dried, will cause either dirty gray or dark spots to appear. Every subsequent "dipping" process to cure this, that involves a washing process, repeats the same conditions. Hand marks and failure to wash free from acid aggrevate these conditions.

We would suggest that the annealed coils be carefully examined immediately after the pickling and washing operations, to determine whether this operation is working properly. Then re-examine the same coil a little later and note whether the tarnish has appeared. The action of the process should be fairly rapid.

If furnace conditions and the pickle solution and practice in handling are right, there should be no trouble in getting a perfectly clean coil from the bath; the tarnishing would come later. A method in general use is thrashing the coils in a tumbling barrel built for this purpose, using bran as a drying medium. This gives a bright finish to the wire. The fine wire will not admit of this treatment and must be box annealed.

W. J. Pettis.

Deposition of Pink Gold

By ALFRED K. PRITCHARD, Jr.
Continental Optical Corporation, Rochester, N. Y.

Methods of Obtaining the Finish Which Has Grown Popular in the Jewelry, Optical and Novelty Trades

AMONG the alloyed gold deposits that have found recent favor is Pink Gold, known under various trade names as "Coral," "Suntan," and "Fleshtone" Gold. It is extensively used in the optical and jewelry lines as an ornamental finish on either a gold or gold filled base metal, and also as a flash deposit on brass and brass plated novelties. When properly executed the finish has a very pleasing appearance; and the red, white, and yellow colors may readily be distinguished in the blended deposit. Roseleur deposited pink gold nearly a century ago, the formula containing gold, copper, and silver. But today we use nickel and palladium to replace the silver, producing a deposit which is fairly resistant to tarnish. For the reason that the trade disagrees as to the exact shade of color, a basic formula is first given and further additions may be made according to the particular shade which is required.

Solution Composition

Water	1.	liter
Sodium phosphate	60.	grams
Sodium cyanide	3.0	grams
Nickel cyanide	3.0	grams
Palladium (as chloride)	3.0	grams
Metallic gold (as cyanide)	0.25	grams
Copper cyanide	0.5	grams

To avoid confusion in the use of both troy and avoirdupois weights, the quantities given are all in grams per liter. Dissolve the chemicals in the order given in a small quantity of water and boil for about one half hour. Add this solution to the tank and fill with water to the proper level. Stir thoroughly and electrolize with full power at working temperature (55 to 65 degrees C.). If the metal salts are not amalgamated by boiling and electrolizing, the deposit will be uneven in color.

Equipment and Preparation

The solution will require a current pressure of from 4 to 6 volts, depending on the temperature at which it is operated, the amount of cathode surface, and the color desired. If possible, a carbon pile rheostat should be used in preference to the series type as it will give more variations in resistance enabling the operator more flexible control over the color of the deposit. An enameled iron tank may be used for the solution. The tank should be fitted with a steam coil for heating and in addition, a cold water coil for cooling quickly will prove useful. The anodes should consist of either nickel or hard carbon. Due to the low free cyanide content of the solution, the nickel anodes are not attacked to any extent and the carbon anodes are, of course, insoluble.

The work should be wired or racked in such a manner as to avoid shading as much as possible, and cleansed thoroughly, preferably in an electric cleaner. If the work to be plated is channeled, a weak acid dip after the regular cyanide rinse, is necessary. This will avoid the introduction of an excess of cyanide in the solution.

Solution Control

In this type of solution we have four metals of different potentials which must be deposited simultaneously. The metals are not plated out in the same ratio, therefore they must be replenished in the same proportion in which they are deposited. To the basic formula add gold or copper or both, until the proper shade is produced. If a lighter shade is desired, add nickel and palladium. The free cyanide content of the solution is an important factor. The metals added for replenishing should contain no more cyanide than that which is necessary to take up the salts. It will be found convenient to make up stock solutions of appropriate strength for making additions. It may be found necessary at times to add small quantities of cyanide due to the conversion of the cyanide by the high temperature at which the bath is operated. A deficiency of free cyanide is usually indicated by a smutty deposit. An excess of cyanide is shown by failure of the solution to deposit rapidly. A covering deposit should be obtained in from 20 to 30 seconds. Bright deposits may be obtained up to 15 minutes of immersion. If heavier deposits are required, the work should be lightly buffed after plating. Temperatures ranging from 55 to 65 degrees C. and a current pressure of from 3 to 6 volts may be employed. An elevation in temperature and voltage increases the deposition of nickel and palladium; a decrease in temperature and voltage favors the deposition of gold and copper. It is advisable to electrolize the solution for a short time after making additions.

Conclusion

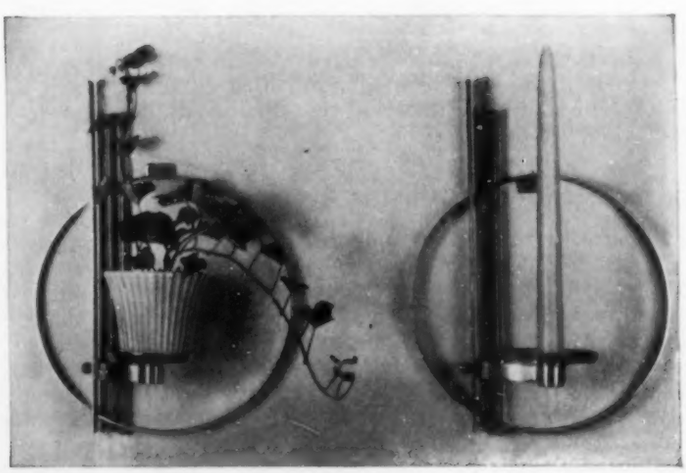
This article has been written in answer to questions appearing in the METAL INDUSTRY concerning pink gold. As this solution is operated entirely upon an empirical basis, it is difficult to give set rules for its maintenance and successful results depend largely on the experience and good judgement of the plater. The writer has used the above method on a production basis for the past year, producing thousands of pieces of work daily in this finish.

Christmas Greets the Metal Industries

METAL products go into huge consumption at this season of the year. Bought chiefly for gift purposes, they range from toys and trinkets to purely utilitarian things like kitchen utensils, which, however, can also be decoratively finished by plating, lacquering, enameling or otherwise. Between the two lies the class of products which must be both beautiful and useful: decorative hardware, silverware, cutlery, time pieces, automobiles, and so on; the list is endless.

Non-ferrous metals, together with plating, lacquering and other types of protective and decorative finishing, figure prominently in metal gift ware. On this page are shown a few typical examples of the sort of fine metal objects that have special gift appeal. At the top is some excellent silverware made by the International Silver Company, Meriden, Conn. The center photo shows a toy locomotive made of zinc die castings for which the New Jersey Zinc Company, New York, supplied the die casting alloy; such toys can be finished by plating or lacquering, or combinations of both. At the foot of the page are a brass bookend of modernistic design and an unusual wall bracket of brass and copper, which can be used for holding either a flower pot or a candle; such brass and copper products lend themselves to finishing in either plain, bright or satin polishes, or in chromium, silver, black nickel or other kinds of electroplating; the Copper and Brass Research Association supplied the photographs reproduced below.

Courtesy, C.&B.R.A.



EDITORIALS

Fear of Currency

THE Administration has been engaged in the project of buying gold in the United States and abroad at prices above the market. The reason for this campaign is to raise the price of gold, by so doing depreciating the value of American paper currency abroad and thus raising the prices of raw materials which are sold in the world market. This policy has resulted in an uproar. On one side are massed a number of leading trade associations and business organizations of the country who are united in fundamentally opposing the plan. In fact some have gone so far as to demand a prompt restoration of a permanent gold standard. Probably the best statement for this group is contained in the letter of resignation of Professor Sprague, as special assistant to the Secretary of the Treasury. In this letter he opposed the present policy of depreciating the dollar through gold purchases in foreign markets because he was convinced that this policy will prove ineffective in securing a speedy rise in prices except in some isolated instances, and most important because such a policy created a distrust of the national currency which adversely effected the credit of the Government.

Of even more importance was Professor Sprague's intimation that under this policy there is danger of a drift into unrestrained inflation.

On the other side we find a smaller group but one which includes some very important individuals like F. A. Vanderlip, formerly president of the National City Bank and the heads of Sears-Roebuck and Remington-Rand, agreeing with the Administration.

When experts disagree, it is time for the layman to be silent as he cannot know which way to turn. But there is one thing that the intelligent layman knows. Our trouble to-day is not that the gold purchases have done us any harm as yet. Our trouble is fear. So far we are unhurt; in fact those who are fortunate enough to be in the fields in which prices have risen have been benefited. But we are all oppressed by fear that this campaign is only the forerunner. A later step may be direct currency inflation—printing press money—wallpaper dollars. There is no question that this fear which has assumed huge proportions, is a brake on business recovery.

Whatever policy is finally decided upon with regard to gold purchases, the country—the man on the street as well as the business interests—are entitled to be free from the spectre of uncontrolled currency inflation. The Administration owes this assurance to the Nation.

Machinery Unjustly Accused

THE machinery building industry, it is generally admitted, has suffered more than any other. Its output, it has been estimated, has fallen off fully two thirds from the peak. The effect of such severe curtailment in expenditure by the users of machinery has been that by the end of 1933, the United States will have fallen more than $40,000,000,000 behind its capital goods requirements, according to the Machinery and Allied Products Institute.

A leading authority on machinery, R. E. Flanders, Chairman of the National Code Committee of the National Machine Tool Builders Association, has pointed out that a part of the reason for this terrific decline is that the public has been assailed with social theories, many of them unsound, which have had a direct effect on this industry.

The first is that industry is directly responsible for the depression. This is obviously untrue. Industry has been a sufferer, along with others. It has made mistakes; there have been cases of overreaching. But it has been no more "responsible" for the crash than any other single group.

The second fallacy is that the machinery industry has brought about over-production—another misstatement. We have never had real over-production in our history. We have had only under-consumption. We have never produced more than our people could use, but only more than they could buy. To say that machinery caused over-production is fallacious. It has made low-cost production possible.

The third fallacy is that improved machinery, labor-saving devices, have become a social danger. This is the worst of all. Improved machinery, speedier methods of production, lowered costs of operation are the hope of humanity. To be sure there have been times when one or another group has gone ahead or dropped behind in the general march. In the absence of any national coordination, how could it be otherwise? But machinery, far from being a danger, is the very foundation of mankind's progress toward a better and an easier life.

So much for philosophy. To return to hard facts, we repeat that the United States has fallen more than $40,000,000,000 behind in its capital goods requirements. That means that our plants are in a poor state. They are wearing out and not being replaced. Inefficient machinery may be as bad as no machinery. It is absolutely vital, not only for the prosperity of the nation as a whole, but for the direct prosperity of the manufacturer, the simple self-interest of the individual, that machinery be kept up the last word in efficiency.

The Open Shop

ONE of the burning topics of the day is the question of the relation of the employer to his men under the codes, all of which by law include a section (after Section 7a of the National Industrial Recovery Act) to the effect that employees have the right to choose anyone they desire to represent them. The argument has grown hot on both sides.

One of the sanest and best considered analyses of this situation was given by Arthur M. Torrey, Secretary of the Employees Association of North Jersey, at a recent meeting of the New Jersey Foundrymen's Association. He defined the "open shop" as a shop in which employment is open to qualified workers without regard to membership or non-membership in any labor organization. Under the law, no employer is denied the right to bargain individually with any worker, if the worker so chooses. It is the worker's choice as to whether he should bargain individually or collectively through a representative. If any employer should make a contract with a particular organization to employ only members of that organization, and if that organization does not have 100 per

cent membership among his employees, that would be, in effect, a contract to interfere with his workers' freedom of choice of their representatives or with their right to bargain individually. Section 7a does not take away the right of employees and an employer to agree to continue their relations on an open shop basis which has proved mutually satisfactory. What it does clearly prohibit is the pretended exercise of the right of an employer to select, retain or advance employees on the basis of individual merit, simply as a device for compelling employees to refrain from exercising their rights of self-organization. Mr. Torrey pointed out, for example, that in the Newark district a great majority of the manufacturing plants are of small size and most of the negotiations are carried on directly between the employers and the employees themselves, without recourse to outside agents.

He expressed his confidence that if employees were fully and frankly informed of all their rights, if they could be free from the coercion and interference of professional organizers, and if management conducted its business so as to merit the respect and confidence of the employees, industry under the NRA would continue to be predominantly open shop.

Plating Under Fabricated Metals Code

THE metal finishing and metal coating industry has been placed under the code for Fabricated Metal Products manufacturing which has been approved and signed by the President (see page 397 of this issue). The code applies to the thousands of electroplating departments of manufacturing plants, of course, but it applies with special force to the job plating industry.

To those who feel that platers should have their own code, it must be pointed out that they could have had it if the trade had been nationally organized. Scattered and diversified as it was, a number of codes were submitted from various parts of the country, none of which really represented the national industry as a whole except for the Master Platers' Institute which was too young to have effected complete coverage of the country. For that reason the Administration placed electroplaters under the metal fabricators' code. The way is not closed, however. Electroplating may still govern itself. We are informed by F. F. Pierdon, of Washington, D. C., who has been in touch with the Administration, that if the platers associations could get together and set up an effective national organization, they could offer a supplemental code which would be considered on its own merits.

The code of the fabricated metals industry can be worked under. It is not perfect for the electroplaters; no outside regulation could possibly take care of the details of such a specialized trade. But the correction of this situation lies entirely with the job platers themselves. If they will organize nationally, they can get the consideration which they need.

Why Study?

AT a recent meeting of the Electroplaters' Benevolent and Protective Association in New York, an old subject came up which elicited considerable discussion. Why should platers study to improve their knowledge of their art when the wages paid them are so miserably low? Of what use is the knowledge of solution analysis and solution control when the reward for this knowledge and years of experience are in a great many cases as low as $25.00 a week?

One answer to these questions was given by Charles H. Proctor, who spoke at that meeting. He pointed out that in all fairness, it was necessary to recognize the difference between a plater and a foreman plater as well as a plater and a plater's helper. The plater's helper is in many cases, unskilled; the plater is skilled, but the foreman plater is highly skilled. The ordinary plater is neither asked nor required to analyze and control solutions. That is up to the foreman plater, and if he cannot do it, it is done by a chemist. The foreman plater who does not need the chemist for this work protects himself by his knowledge.

It should be, and of course is, the aim of every plater's helper to become a full-fledged plater. Similarly it must be the aim of every plater to become a foreman plater.

It is only natural, of course, that electroplaters should consider their economic welfare. It is to be expected that they look after themselves. It would be part of wisdom, however, for them to recognize the divisions of their trade. To be sure there may be many platers who are capable of holding foremen's jobs, which they cannot find. They cannot, however, in all fairness ask for foreman's pay for plater's work. What the different rates of pay should be, is important, of course, but the difference in grades and the variation in status of those employed in a plating shop must be recognized.

A New Type of Competition

THROUGH all of the hundreds of codes which have been presented and through those codes which have already been approved in Washington, we see one thread interwoven which is identical throughout. Even though the definite fixing of prices is not permitted, it is clear, by the fixing of hours, wages and the very detailed standards of fair competition, that we are working toward a new type of business.

At all times competition has rested on three factors, quality, service and price. In recent years, quality has been secondary, service has been promised but has not been kept up to the mark, and the bulk of the selling effort has been concentrated on price. Consequently, we have gone through a period of trade wars.

If industrial codes are successful, selling will now have to concentrate on quality of product and the service rendered by the seller. And of utmost importance in such sales is the reputation of the seller.

Quality and service can be maintained by unremitting effort but they are only partially effective unless the reputation of the firm is definitely known to be behind them. The salesman makes promises to his prospect, but to be believed, these promises must be backed by the reputation of his firm, past performances and consistent efforts to keep the trade, its public, informed of its efforts by advertising.

If the day ever comes when business will be done on a one-price basis with the competition restricted to the other elements, that will be a happy day for business. It may be the unattainable ideal of industry, but it is certainly a worth while ideal to strive for.

The Economics of Recovery

On the following page we print a review of a book of unusual interest to our readers, "The Economics of Recovery," by Col. Leonard P. Ayres. It points to one way out of the depression.

New Books

One Way Out of the Depression

The Economics of Recovery. By Leonard P. Ayres. Published by MacMillan Company. Size 5 x 7½; 189 pages. Price $1.75.

During the past four years the United States, and for that matter all the rest of the world, has been flooded with plans for recovery. Everybody has a plan which he is certain is infallible. Occasionally—very occasionally—an article or a book is written by someone in a position of authority who is really an expert in economics. Such books should be read, and this book by Mr. Ayres is one of them.

The author covers our present situation completely beginning with a brief general survey of our economic history, showing that our depression is not an altogether new phenomenon. It is a normal sequence to a war. It is the deepest and widest known depression because it has followed the greatest war in history. Like all others, the World War was followed by (1) Commodity price inflation; (2) Farm prosperity and farm land speculation; (3) Price deflation and the primary post-war depression; (4) A period of city prosperity and widespread speculation; (5) Secondary price deflation and a long secondary post-war depression.

All of the explanations for the depression have fallen into three classes:

1. The depression signals the downfall of private capitalism.
2. The depression is a monetary phenomenon caused by shortage or mal-distribution of gold or some other defect in the structure of the money systems of the leading nations.
3. The depression is a direct result of the war and consists of a great series of major mal-adjustments between production, demand and the flow of credit, complicated by difficulties caused by the burden of existing debts. The author is one who believes in the third class. In his own words "The true lesson of this depression is that we cannot afford any more great wars."

Our recent prosperity was induced by the expansion of indebtedness. Any of us can enjoy a period of prosperity by borrowing money and spending it for the things we want. During most of the time from 1922 to 1929 the whole world was enjoying that kind of prosperity.

Government efforts to aid business recovery may be classified under two groups:

1. Efforts to remove barriers blockading business.
2. Attempts to stimulate business by the extension of public credit, direct regulation of business, inflation, etc.

The author believes that the efforts of Government to force business recovery through stimulation must prove futile unless recourse is had to extreme measures such as may involve deliberate inflation. Expenditures for public works cannot possibly be made large enough to overcome the depression.

The author points out that basically this depression, like all others, is caused by the fact that there is a long and imporant decrease in the making of durable goods—capital goods, machinery, buildings and construction. Half of the present unemployed were engaged in the production of such durable goods. It is the author's opinion that even the present contemplated expenditure by the Government of $3,300,000,000 for public works will fail to produce the desired results because of the inadequacy of the amount. He shows this by contrasting it with the amount expended for such materials in 1929 alone—$40,000,000,000.

It is the author's thesis that the solution of our troubles is to be found in the expansion of private enterprise, and not in the expenditure of public funds. We must re-establish a market for originating and distributing corporate bonds, and for equipment trusts and real estate mortgages. We must also seek recovery through the expansion of private enterprises by making it possible for these activities to be operated at a profit. Another and perhaps the most important essential to revival of our durable goods industries is sound money.

The author points out that there are many kinds of sound money, and that no one kind is indispensable. What is essential is that our people should be convinced that the Administration and the nation have pledged themselves to the re-establishment of a sound money system, in which we at home and the people abroad have enduring confidence because of their faith that it will continue to serve adequately as the medium of exchange and a standard of value. But money must be based on something of intrinsic value, such as gold; the quantity of money and the bank credit based upon it must be kept under control and closely adjusted to the needs of agriculture, industry and trade.

The author fully recognizes that we still have to deal with the problems of the excessive burdens of the debts of individuals, corporations, states, counties and municipalities. He is against writing them off by default or inflation, and suggests re-financing on easier terms.

In a nutshell, the author summarizes his opinion of the fundamental requisites for recovery. They are:

1. Reliance of business expansion through enterprise and profit making activities.
2. The adoption of a sound money policy.
3. The use of Federal legislation and Federal credit to aid in dealing with certain of the key problems of excessive burdens of debt.

This book is truly the representative opinion of the old school, put forward by one of its finest exponents. The author is vice-president of the Cleveland Trust Company and a nationally known authority on economics; his statistical researches have been published throughout the land (he is the author of "Business Progress from 1790 to Date," published in **Metal Industry** for June 1932, page 241.) Many will disagree with him. There is no one, however, who can question his reliability or his knowledge of his subject.

National Metals Handbook. Published by American Society for Steel Treating. Size, 4½ x 7; 1453 pages. Price $10.

The 1933 edition of the handbook which is recognized as the most authoritative compilation of its kind. A large portion of it is concerned with iron and steel, but the non-ferrous section comprises 92 articles and approximately 500 pages. Each article is written or compiled by recognized authorities in the non-ferrous field. The subjects covered, to list them briefly, include aluminum and aluminum alloys including die castings; various brass foundry alloys, largely copper base; lead and lead alloys; magnesium alloys; nickel alloys; tin alloys; zinc alloys, and the precious and rare metals, including gold, platinum, palladium, etc.

Articles are also devoted to brass temperature measurements, etching for metallographic examination and a glossary of x-ray terms.

The book is without question an indispensable part of the library of every metallurgist.

Journal of the Institute of Metals. Volume 49. (Proceedings.) Edited by G. Shaw Scott. Published by The Institute of Metals, 36 Victoria Street, Westminster, S.W. 1. 416 pages. Cloth. Price 31s. 6d.

All the communications made at the meeting from September 12-15, 1932, to the Institute of Metals are reproduced in full, together with the discussions. These papers cover a wide and practical field, as is indicated by such titles as "Mould Materials for Non-Ferrous Strip Ingot Castings," "Mechanical Properties of Nickel Wires," "Attempts at Making Beryllium-Magnesium Alloys," "Modern Works Plant and Equipment for the Hot-Working of Nickel and Nickel Alloys" and "Properties of Commercial Varieties of Copper at High Temperatures." By far the most extensive contribution is Dr. H. J. Gough's 76-page Autumn Lecture on "Corrosion-Fatigue in Metals," in which almost classic dissertation the author en-

deavors to reduce the mechanism of corrosion-fatigue—a vitally important matter to engineers—"to an ordered sequence of chemical and physical events which are explicable in the light of existing knowledge relating to corrosion and fatigue phenomena."

These papers were published in abstract in METAL INDUSTRY for October, 1932.

1932 A.S.T.M. Proceedings. Published by the American Society for Testing Materials, Philadelphia, Pa. Vol. 1, 1071 pages; Vol. 2, 824 pages. Price $5.50 to $7 per volume, depending upon binding.

Part I contains the annual reports of the many Society committees and the technical papers and standards appended thereto. The annual address of the President, entitled "Research and the American Society for Testing Materials," and the report of the Executive Committee are also included.

The reports of the non-ferrous committees cover their activities in the following fields:

Copper Wire.

Corrosion of Non-Ferrous Metals and Alloys.

Electrical-Heating, Electrical-Resistance and Electric-Furnace Alloys.

Copper and Copper Alloys, Cast and Wrought.

Die-Cast Metals and Alloys.

Light Metals and Alloys, Cast and Wrought.

A paper analyzing the data on physical properties of aluminum-base die-casting alloys is appended to the report on die-cast metals and alloys. The 1932 report of the Committee on Corrosion of Non-Ferrous Metals and Alloys describes its very extensive test program and includes detailed descriptions of recommended practices for several laboratory accelerated corrosion tests.

Other reports involve Methods of Testing, Metallography, and Nomenclature and Definitions.

Part I also includes the 85 tentative standards issued or revised in 1932, as well as the many tentative revisions in standards.

Part II includes many papers dealing with important problems and subjects relating to the non-ferrous metals industries. The 82-page report of the extensive research investigation on embrittlement of hot-galvanized structural steel is given. Other papers cover the effect of zinc coatings on endurance properties of steel and factors affecting the Preece test for zinc coating.

Strictly non-ferrous subjects covered are factors affecting the physical properties of cast red brass, mechanical properties of white-metal bearing alloys at different temperatures, method of preparation of lead and lead alloy cable sheath for microscopic examination and effect of cold working on Izod notched-bar impact value of Monel metal.

A Study of the Embrittlement of Hot-Galvanized Structural Steel. Published by the American Society for Testing Materials, Philadelphia, Pa. 109 pages. Price $1.

Technical Papers

Rubber Coatings for Abrasion and Corrosion Resistance. By Leonard Church. Chemical and Metallurgical Engineering, September 1933. Adherent protective coatings of soft and hard rubber can now be applied to surfaces of any shape by the "anode" process. This process consists of immersing the article in rubber latex to which the necessary compounding ingredients have been added and in which a coating of wet latex rubber of the desired thickness is applied. The deposit is dried and then cured to a soft, semi-hard or hard rubber state depending upon the quantity of sulphur and other ingredients used.

The deposit is put on electrolytically. The small rubber globules in the latex have a negative electric charge and travel toward the anode when a direct electromotive force is applied.

The anode rubber is said to be extremely strong and tough and to have high tear resiistance; also resistance to wear and abrasion.

Research in Fundamentals of Combustion Space Requirements in High Temperature Gas Furnaces. American Gas Association Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio. First Bulletin, Committee on Industrial Gas Research. Project No. 20, Report No. 723.

Correspondence and Discussion

Wealth and Humanity

To the Editor of **Metal Industry:**

Regarding present business conditions, I do not expect that we shall reach that state of prosperity which we enjoyed durthe year of 1925 and forward, but it is just as well.

We have been educated to greed and we have carried it too far until the structure has toppled over when all the old standards of reliability are pretty well shattered; let us hope that the standard of personal responsibility still maintains.

If I were a member of Congress, I should endeavor to introduce and pass a bill that no estate should net more than $1,000,000 and the balance should go to the State. Therein some of the tax burden would be eased and the estate would have enough. There would have to be some modifications, now and then, relating to business capital, but generally speaking that net amount would be quite ample.

You know in the textile industry of the South they have hitched children to machines almost as soon as they could walk, and it has required the strong arm of the law, the N.R.A., to stop that and allow them to go to school. Perhaps we may call that Government control Socialism, but I think we had better call it Humanism and I think we need more of it.

Frederic B. Stevens

Detroit, Mich.

Government Publications

United States Government publications are available from the Superintendent of Documents, Government Printing Office, Washington, D. C., to whom proper remittance should be made to cover price where a charge is mentioned. In some cases, as indicated, apply to governmental body responsible for publication.

Industrial Codes. National Recovery Administration, Washington, D C. Printed leaflets giving proposed codes of fair competition have been issued by the Government Printing Office at 5 cents each, on the following industries:

Secondary Aluminum and Alloys Industry.
Aluminum Fabricating Industry.
Metal Window Industry.
Metal Tank Industry.
Buffing and Polishing Composition Industry.
Non-Ferrous Ingot Metal Industry.
Grinding Wheel Industry.
Scrap Iron, Nonferrous Scrap Metals, and Waste Materials.
Railway Brass Car and Locomotive Journal Bearings and castings Manufacturing Industry.

Zinc in Relation to General and Industrial Hygiene, by C. K. Drinker, M. D., and L. T. Fairhill, Ph.D., Harvard School of Public Health. Printed in Public Health Reports, United States Public Health Service, Vol. 48, No. 32, August 11, 1933. Supt. Doc., 5 cents.

Cadmium Industry in 1932—Advance Summary. Bureau of Mines, Department of Commerce, Washington, D. C. Report No. M.M.S.216. Available free from Bureau.

Platinum and Allied Metals in 1932—Advance Final Summary, Bureau of Mines, Department of Commerce, Washington, D. C. Report No. M.M.218. Available free from Bureau.

Report of the National Screw Thread Commission. (Revised 1933.) Misc. Pub. No. 141, Department of Commerce, Supt. Doc., 15 cents.

Fourdrinier Wire Cloth. Bureau of Standards. Commercial Standard CS36-33. (Second edition.) A recorded standard of the industry. 5 cents.

Shop Problems

This Department Will Answer Questions Relating to Shop Practice.

ASSOCIATE EDITORS

Metallurgical, Foundry, Rolling Mill, Mechanical

H. M. ST. JOHN
W. J. REARDON
W. J. PETTIS
W. B. FRANCIS

Electroplating, Polishing, and Metal Finishing

O. J. SIZELOVE
G. B. HOGABOOM
A. K. GRAHAM, Ph.D.
WALTER FRAINE

Electric Soldering of Jewelry

Q.—Please explain the electric method of soldering jewelry.

A.—The electric method of soldering jewelry is an application or adaptation of the age-old sweating process. In sweating a small piece to a heavy one, the surfaces of contact are tinned, then placed together and a hot soldering iron applied to the small piece. The tinning means the use of a solder having a much lower melting point than that of the metal pieces. The hot soldering iron melts the solder on the surfaces in contact and these units as one piece.

It is sometimes an advantage to apply pressure to the smaller piece so as to prevent any laterial movement, and also to gain quicker heating; also, when the film of solder is melted and it flows freely around the joint, a sudden chilling by the application of water or a cold iron will set the joint quickly, and relieve the operator from further attention. With two heavy pieces it is sometimes necessary to use a flame heater if a soldering iron is too small and slow.

The principle of sweating as described above can be applied to small work, such as jewelry, on a production scale. Tin the small parts by treatment in an acid cleaning bath, and dip in molten solder. Place a quantity of the parts in a fine mesh wire basket and immerse long enough for the parts to become fully heated. Shake out the work and spread on a clean surface of metal, wood or paper. Keep the solder covered with powdered charcoal to prevent oxidization. It is assumed that the larger parts have a bright white metal back that does not need tinning. If not, then the sweating spots must be treated.

Electric heating is the cleanest and the safest. A torch with a needle-pointed flame of acetylene is efficient. The ordinary electric soldering iron with a flattened point to cover one or more pieces will do good sweating. For a larger surface use a regular laundry pressing iron. This would cover a large number of the small pieces such as, for instance, the joints and catches for the pins on the backs of ornamental scarf holders. The makers of electric smoothing irons could probably adapt their heating elements to forms of metal surfaces other than the pointed bottoms of smoothing irons.

It might be possible to devise an electric sweater of any desired shape and area by using one or more of the heating elements used in smoothing irons. Attach these to the back of the plate. Cover the elements with a thick layer of asbestos to confine the heating to the plate. Attach any form of handle most convenient for the work.

W. B. F., Problem 5,248.

USE THIS BLANK FOR SOLUTION ANALYSIS INFORMATION

Fill in all items if possible.

Date.....

Name and address: .....**Employed by:** .....

Kind of solution: .....**Volume used:** .....

Tank length: .....**width:** .....**Solution depth:** .....

Anode surface, sq. ft.:.....**Cathode surface, sq. ft:** .....

Distance between anode and cathode: .....**Kind of anodes:** .....

Class of work being plated: .....**Original formula of solution:**.....

REMARKS: Describe trouble completely. Give cleaning methods employed. Send small sample of work showing defect if possible.

Use separate sheet if necessary. _____

_____

_____

_____

NOTE: Before taking sample of solution, bring it to proper operating level with water; stir thoroughly; take sample in 2 or 3 oz. clean bottle; label bottle with name of solution and name of sender. PACK IT PROPERLY and mail to METAL INDUSTRY. 116 John Street, New York City.

Black on Aluminum

Q.—I am sending you some samples of black nickel. I am having trouble getting the shade I would like to get. I want a dead black on brass or aluminum.

A.—We doubt very much whether you will be able to duplicate the finish on sample submitted with a black nickel solution.

We would suggest that the aluminum be etched in a muriatic acid solution to produce the dull or etched surface, then plated in black nickel solution and lacquered, using a matt lacquer with a black dye mixed in.

If you think that there is anything wrong with your black nickel solution, send us a sample and we will analyze it and report to you.

O.J.S., Problem 5,249.

Metal in Salts

Q.—How many ounces of actual metal does one pound of single nickel salts contain? Double nickel salts? How much copper is there in one pound of copper cyanide? In one pound of copper carbonate?

A.—Single nickel salts contain approximately 21% metallic nickel; one pound will therefore have 3.36 oz. metallic nickel.

Double nickel salts contain approximately 15% metallic nickel; one pound will therefore have 2.40 oz. metallic nickel.

Cyanide of copper contains approximately 70% metallic copper; one pound will have 11.2 oz. metallic copper.

Copper carbonate contains approximately 52% metallic copper; one pound will therefore have 8.32 oz. copper.

O.J.S., Problem 5,250.

Molybdenum Deposition

Q.—Can molybdenum be electrolytically deposited, and if so, can you give me a formula for making a molybdenum solution for plating iron and metal parts?

A.—We are familiar with two patents that have been issued upon the deposition of molybdenum, but both solutions will produce only deposits that are very thin and of many colors. In fact, they are used for coloring metals for decorative effect. These are United States patents No. 1,095,357 and No. 1,723,067, copies of which can be purchased by applying to the United States Patent Office.

O.J.S., Problem 5,251.

Nickel Analysis

Q.—Am sending you sample of nickel solution which I use for plating zinc base die castings. This solution has been giving trouble at times. The deposit is fairly good, but a dark, almost black deposit forms on the edges of the work the first few minutes of plating. Then it whitens up again, but in most cases it chips off the ends. You can see this on the various samples of work I enclose. If I put a lot of old racks in the solutions and give it all the current I can, a green, spongy deposit forms on the tips of the racks.

A.—Analysis of nickel solution:

Metallic nickel	2.58 oz.
Chlorides	4.44 oz.
pH	5.2

The chloride content of the solution is too low and the pH is entirely too low. We suggest that you add 3 oz. sodium chloride and 3½ cubic centimeters of 26° ammonia to each gallon of solution in the tank.

It is quite difficult to remove the zinc from a die cast nickel solution, and when the zinc content becomes too high it is advisable to discard the solution and make a new one.

The green deposit that you obtain on the work is due to a condition of the solution, and when you have made the suggested corrections this trouble will not occur.

O.J.S., Problem 5,252.

Black on Brass

Q.—Please recommend a good black finish for brass, to be applied either by a simple dip method or oxidizing in a solution with current. I have tried out various solutions and have found that most of them rub off very easily and must be lacquered in order to get good adhesion.

A.—We suggest black nickel plating. Use the following formula:

Double nickel salts	8 oz.
Sodium sulphocyanide	2 oz.
Zinc sulfate	1 oz.
Water	1 gallon

Adjust the pH to 6 or 6.2, and use 1 volt. The brass should be plated for a few minutes in the regular nickel solution before plating in the black nickel solution.

O.J.S., Problem 5,253.

Nickel Analysis

Q.—Please analyze the nickel solution I am sending. Solution is 300 gallons, operating at room temperature, with 1½ volts. What causes white spots on chromium deposits?—G. P.

A.—Analysis of nickel solution:

Metallic nickel	3.65 oz.
Chlorides	2.84 oz.
pH	5.2

The pH is too low. It should be adjusted by adding 25 fluid ounces of 26° ammonia to the 300 gallons of solution.

The white spots on the chromium deposits are due to the improper coloring operations on the nickel deposit. After the nickel deposit is colored with lime composition it should be colored again by using a dry lime composition and a soft muslin buff.

O.J.S., Problem 5,254.

Removing Silver From Copper Bath

Q.—How can I remove silver from a copper solution? The silver got in when the jar holding my silver solution was broken while standing near the copper bath, which was about 10 times as large as the silver bath. I now get a silver plate from the copper tank. I would like to save the copper solution.

A.—To remove the silver from the copper solution we would suggest that you hang some old racks or sheets of iron on the cathode rod, and use a low current density in plating the silver out of the solution.

O.J.S., Problem 5,255.

Saving Stripped Gold

Q.—We have accumulated a number of silverplated cigarette cases and large fruit bowls that are gold lined. We strip the silver from them. Is there a method whereby we can recover the gold? Our silver strip consists of sulphuric and nitric acid.

A.—We do not know of any method to recover the gold in the stripping solution you are using. The gold, being insoluble in the strip, will probably be found in very fine particles mixed with the sludge in the bottom of the strip crock.

We suggest that the gold be stripped from the work before the silver is removed by using a cyanide solution made of 8 ounces of sodium cyanide to one gallon of water. The gold can then be precipitated by adding fine zinc. Decant the clear liquid, dissolve the zinc with nitric acid and then, after washing thoroughly, dissolve the gold in aqua regia. If any silver is precipitated with the gold it will be found as a chloride at this point, and can be removed by filtering. Ammonia is then added which will precipitate the gold as gold fulminate, which can be taken up with the sodium cyanide and used to replenish the gold solution.

O.J.S., Problem 5,256.

Equipment

New and Useful Devices, Metals, Machinery and Supplies

Buffing and Coloring Compound

The Lea Manufacturing Company, Waterbury, Conn., has developed Learok, a new compound for buffing and coloring, containing no free grease. It is said to be a radical departure, producing a clean, bright surface on metal quickly and economically, and eliminating a number of operations on most metals. It is said to be suitable for brass, aluminum, stainless steel, copper, tin plate, nickel plate, chromium, pewter, hard rubber, bakelite, plastics, etc. It is said to eliminate stain spotting by reducing washing and cleaning requirements.

Learok comes in solid cylindrical bars, not in cans, and will not slake, freeze or otherwise spoil, it is stated. Convenience in use is stressed, bars being 2¼" diameter by 7" long, weighing approximately 1¾ lb.

Super-Durable Lacquer

Roxalin Flexible Lacquer Company, Inc., 36-40 Thirty-sixth Street, Long Island City, N. Y., has developed a new lacquer coating of extremely high durability, which is suitable for a variety of products other than the bowling pins for which the material was at first designed. Terrific impact of bowling balls against pins coated with the new coating does not faze the finish, according to Roxalin. It is said to have astonishing adhesion, and is apparently chip-proof.

It is also stated that a completely new characterstic was developed in this finish. It is said to refuse to pick up dirt. The maker reports it is easily applicable to many products besides bowling pins, and invites inquiries.

Rustproofer in Colors

An entirely new rust-arresting and rust-preventing principle is said to have been employed in a rustproofer recently put on the market. This material comes in liquid form and can be either brushed or sprayed over new or rusted metal surfaces. When applied to a rusted surface, the action of the liquid, it is claimed, automatically welds this inert mass to the base metal and the rust action is stopped. Further, it is stated that a non-porous, moisture-proof, air-tight coating is formed that renders the surface immune to the attack of further rust deposit.

The original treatment can be made into a finish coat by a single application. Aluminum powder, powdered graphite, or dry red lead may be mixed with this new rustproofer and applied to rusted metal surfaces for dual effect. The admixtures give treated surfaces decorative finish. Being transparent, all markings and identification signs remain visible. The trade name of this material is Stonehard Rustproofer. It is made by Stonehard Company, 401 N. Broad Street, Philadelphia, Pa.

New Sandblaster's Mask

A mask of new design has been developed by Chicago Eye Shield Company, 2300 Warren Boulevard, Chicago, Ill. Known as the No. 601 Healthguard, it is designed primarily for sand and shot blasting and other occupations where harmful dusts are encountered. The mask has a soft molded rubber face piece, designed to adapt itself to any facial contour, which seals the interior against outside air. A molded flexible rubber tube, permitting free movement of the head, connects with an air filter attached to an adjustable belt. A quick acting coupling connects the filter to the air supply.

Interior and Exterior Parts of New Sandblasting Mask

When in position, the face piece of the mask is completely covered by an outer hood. Complete mask with hood weighs less than fifty ounces.

The Manufacturer claims that the Healthguard mask offers absolute protection against harmful dusts, regardless of density or length of exposure.

Latest Products

Each month the new products or services announced by companies in the metal and finishing equipment, supply and allied lines will be given brief mention here. More extended notices may appear later on any or all of these. In the meantime, complete data can be obtained from the companies mentioned.

Mercury-Switch Thermometer Controller. A new instrument adaptable for control of temperature, pressure, liquid level or other factors. Catalog 6702 describing it is offered by the maker. The Brown Instrument Company, Philadelphia, Pa.

Portable Electric Grinder. A hand tool for various small or intricate grinding jobs, including finishing of tools and dies. A large variety of wheel shapes is available. Chicago Wheel and Manufacturing Company, 1101 West Monroe Street, Chicago, Ill.

Capacitors. New line of static condensers for power factor correction, with claimed efficiency of 99¾% and temperature rise of 2°C. or less; unit type construction, hermetically sealed; all voltages up to 4600, and any frequency and phase arrangement; any size. The Ideal Electric and Manufacturing Company, Mansfield, Ohio.

The B. F. Goodrich Rubber Company, Akron, Ohio, has an interesting installation of ball bearing units. It embodies a new design, differing from the conventional pillow block, and much simpler, developed by the Fafnir Bearing Company, called the Fafnir Flange Cartridge Unit. This unit permits a conveyer roll shaft to be given a ball bearing mounting by merely extending the shaft through the steel channel web and bolting the cartridge unit in place.

Vise and Wrench. New "Velvo-Grip" tools, said to hold any material without scratching or crushing; wood jaws are interchangeable in vise and wrench, and are made of standard 2x4 lumber. Holds tubular or other shapes of material up to 3 in. cross section. Wolverine Industries, Harbert, Mich.

Portable Lighting Plants. A new development in electric generating units; 1 or 2 cylinder gasoline engine drives; capacities from 400 watts to 3 K. W. Harnischfeger Sales Corporation, Milwaukee, Wis.

Balancers. A new line of universal static balancers known as "Hi-Eff," with automatic weighing scale and calculator; models to handle all kinds of work pieces. Literature free on request to maker, Taylor Manufacturing Corporation, 2330 West Clyborn Street, Milwaukee, Wis.

Surface grinder. Hand feed precision tool room machine with direct motor

connected to built-in anti-friction bearing spindle; many new features claimed by maker, The Monarch Machine Tool Company, Sidney, Ohio.

Stiffness Tester. Model E precision device for testing stiffness and resiliency of thin metals in various forms as well as other materals. Fully described and illustrated in Bulletin E-10133. Smith-Taber, Research Engineers, North Tonawanda, N. Y.

Temperature Control Instruments. Bimetal thermoregulators for controlling temperatures of water baths or ovens. "Quickset" type has range of 60° to 320°F., holding temperature to within 0.02°. "Sturdy" type is available for any temperature range of 54°F. desired and regulates to within 0.5°. American Instrument Company, 774 Girard Street, N.W., Washington, D. C.

Box Strapping Tool. "Steelstrapper" is a new device with automatic seal feed for strapping boxes. It is said to be rapid and highly efficient as a one-unit tool, used on wood or fibre boxes. Acme Steel Company, Chicago, Ill.

Humidity Controllers. A new line of room type equipment, built for various electrical circuits, and with or without indicators, for setting over range of 20% to 80% R.H., to hold humidity within total variation of 2%. Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.

Cleaning Machine. New, fully automatic model of "Hypressure Jenny," a device for all-purpose cleaning, paint stripping, sterilizing, etc., by means of a vapor blast combining heat, pressure and solvent. Machine has been completely redesigned and improved, it is stated. Homestead Valve Manufacturing Company, Coraopolis, Pa.

Grinders. Line of new wide range precision grinders in five sizes, with constant speed motors, said to be readily adaptable for use with lathe, boring mill, planer or other machining units. Hisey-Wolf Machine Company, Cincinnati, O.

Weighing Scales. New "Printweigh" which makes a printed record of weights, and is said to effect economies in receiving, stocking, manufacturing, shipping, inventory, etc. Designed for high production and accuracy. Toledo Scale Company, Toledo, Ohio.

Emery Wheel Dresser Holders. New devices in two types, for application to many kinds of ordinary and special grinding machines, to hold common shanked dressers such as the Huntington, or round shanks for diamonds. Devices weigh about 6 pounds. Graham Manufacturing Company, 71 Willard Avenue, Providence, R. I.

Die Casting Machine, designed in several sizes for various die size capacities, featuring adjustable back pressure of plunger, from 50 to 1500 lb. per sq. in., and core pulling mechanism operated by power on all six sides of die holder. Said to give 6, 10, 18 or 25 complete cycles a minute. Fully automatic operation requires only one operator, it is stated. Kux-Lohner Machine Company, 2145 Lexington Street, Chicago, Ill.

Buff Rake and Evener. A tool for raking buff wheels without tearing the face. Has special replacable teeth, wood handle. Said to be a durable, efficient tool which eliminates all makeshift devices for same purpose. The Lea Manufacturing Company, Waterbury, Conn.

Cleaning by Tumbling

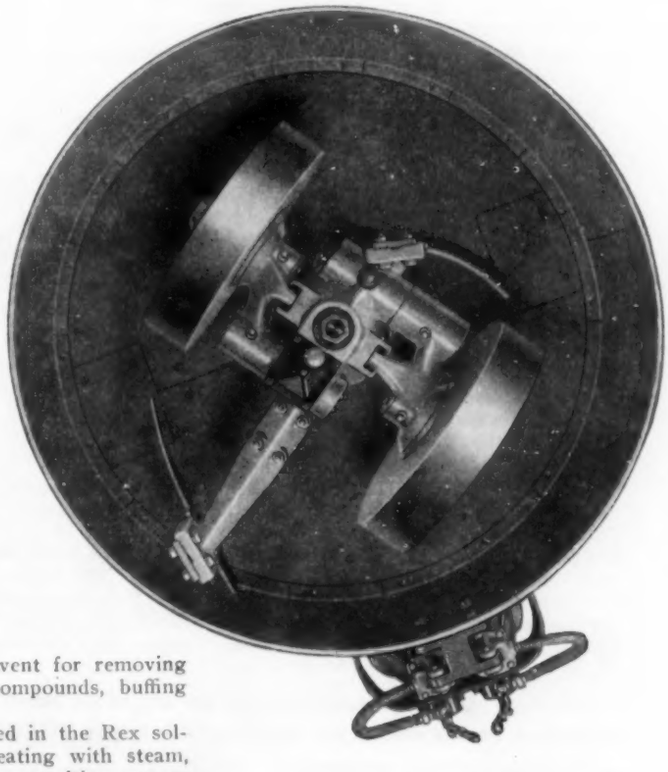
A new compounded solvent has been placed on the market by Rex Products and Manufacturing Company, 13005 Hillview Avenue, Detroit, Mich., with the copyright trade name Perm-A-Clor, This is supplied either in vapor or in liquid state, and it is stated, will not break down or change in the presence of moisture vapors, water or light. It is non-explosive and non-inflammable. It is recommended by the manufacturers as an economical solvent for removing oils, wax, drawing compounds, buffing compounds, etc.

Perm-A-Clor is used in the Rex solvent machines by heating with steam, gas or electricity, the resulting vapors from the boiling solvent are continuously condensed within the machine by means of a water jacket and the condensate is returned to the heating compartment of the machine after filling and overflowing the rinse compartment or passing over the work, according to the type of machine. In this fashion the chemical can be used over and over again. This method of cleaning is recommended by the company for zinc or lead coated metals, aluminum, die castings, copper or brass parts and other soft metals which may be affected by ordinary alkali cleaners; also for use on motor parts, stampings, bolts and nuts, hardware, refrigerator shelves, etc., before such processes as Bonderizing, cadmium plating, copper plating, enameling, painting or lacquering.

The Rex solvent machines are made in types for, (1) Cleaning by solvent vapor; (2) Cleaning by immersion in the boiling solvent; (3) Pumping the boiling solvent on the work; (4) Cleaning by tumbling barrel. Standard models for all of these varieties have been built. They were on exhibit at the Udylite Booth of the National Metal Show at Detroit in October.

Intensive Mixer for Sand and Other Materials

National Engineering Company, 549 West Washington Street, Chicago, Ill., offers the Simpson Intensive Mixer for mixing foundry sands or other dry, plastic or semi-plastic products. The machine has anti-friction bearings on vertical shaft and mullers, and vertical shaft operating in heavy lubricating oil bath. Lubrication system has been simplified to six points. Increased mulling and rubbing action is provided by design, which also allows for adjustment of mullers to eliminate grinding. Pan is stationary, and crosshead carrying mullers and plows are keyed to vertical shaft which is driven through bevel gearing. The machine is said to provide a uniform, homogeneous mixture.



Simpson Mixer for Foundry Sands and Other Materials. View Looking Down on Mill

The machine shown here is the No. 2, Model H, with pan of 6 ft. diameter. There are six other sizes.

Equipment and Supply Catalogs

Zinc. New Jersey Zinc Co., 160 Front St., New York City. Interesting and well illustrated booklet on planning, making and selling products of die cast and rolled zinc. Very good design information. (21)

Rust Preventative. Dearborn Chemical Company, Dept. J-3, 310 South Michigan Avenue, Chicago, Ill. Booklet, illustrated, on compound for rust prevention on iron and steel. Very interesting data for maintainance and production departments. (22)

Nickel and Monel. The International Nickel Company, 67 Wall Street, New York. Large illustrated booklet on castings, containing very interesting and informative data, including average composition and properties of cast nickel and high nickel alloys made by this company. Good application information. (23)

Filtration Equipment. Shriver and Company, Harrison, N. J. Illustrated booklet, "Improved Filtration Cuts Plating Costs," giving useful data on filter presses for plating solutions. (24)

Motor Reducers. The Falk Corporation, Milwaukee, Wis. Bulletin 270; 20 pages; illustrated. (25)

Spray Guns. Eclipse Air Brush Company, Newark, N. J. Catalog 50, a 44-page booklet, fully illustrated. Gives considerable information on spraying and the equipment for this work. This is the Silver Anniversary catalog, an especially nice book in itself, besides the valuable data it contains. (26)

Welding and Riveting Aluminum. Aluminum Company of America, Pittsburgh, Pa. Two new booklets giving full data on this work. Illustrated. (27)

Arc Welding Copper. The Hobart Brothers Company, Troy, Ohio. Bulletin D-7 on the "Long Arc" method and equipment. 12 pages, illustrated. Good copper fabricating data. (28)

Electric Melting. Detroit Electric Furnace Company, Detroit, Mich. Fully illustrated 32-page booklet on the Detroit rocking electric furnace, with full engineering data. (31)

Pyrometers. Mishawaka Industiral Instrument Manufacturing Laboratory, 936 Washington Avenue, Mishawaka, Ind. Leaflets on various types, including a line of low-priced equipment. (32)

Dust Collecting Equipment. Pangborn Corporation, Hagerstown, Md. Illustrated folder. (33)

Screws, Bolts, Nuts. Pheoll Manufacturing Company 5700 Roosevelt Road, Chicago, Ill. Catalog 34, 104 pages; all types and sizes; good technical data. (34)

Aluminum for Truck Bodies. Aluminum Company of America, Pittsburgh, Pa. New edition of an earlier booklet, with expanded engineering data, together with a series of large construction drawings on paper suitable for blue printing. Case histories are given, based on operators' records, showing advantages of aluminum for this purpose. (35)

Forestalling Labor Troubles, by Allen W. Rucker, in collaboration with N. W. Pickering, president, Farrel-Birmingham, Inc., 9 Main Street, Ansonia, Conn. (Free from company mentioned.) No. 4 of a series of pamphlets on various industrial and economic subjects of great interest at this time. (16)

Flexible Shaft Machines. N. A. Strand & Co., 5001 North Lincoln St., Chicago, Ill. New 66-page catalog of ball bearing line of equipment in various sizes and types; also attachments. (17)

American Society for Testing Materials, 1315 Spruce Street, Philadelphia, Pa., has issued a booklet, Purpose and Work, which fully describes the Society's activities, and includes a membership application. (18)

Metal Cleaning Equipment. Colt's Patent Fire Arms Mfg. Co., Hartford, Conn. Leaflet on Autosan automatic cleaning machines. Illustrated. (19)

Electrical Equipment. Crocker-Wheeler Electric Mfg. Co., Ampere, N. J. Complete illustrated catalog of products, including motors, generators and allied equipment. (20)

CO_2 Meters. The Brown Instrument Company, Philadelphia, Pa. Illustrated folder on fuel saving. (29)

Uniform Cost Activities in Trade and Industry. Metropolitan Life Insurance Company, New York. Good data on cost accounting practice. (30)

Save time. Use the coupon below to get any of the above catalogs or bulletins, or for data on any subject not mentioned this month. METAL INDUSTRY will see that you get them promptly.

METAL INDUSTRY
116 John Street, New York.

(Insert below the number printed at the end of each item desired.)

I wish to receive the following bulletins mentioned in DECEMBER: .....

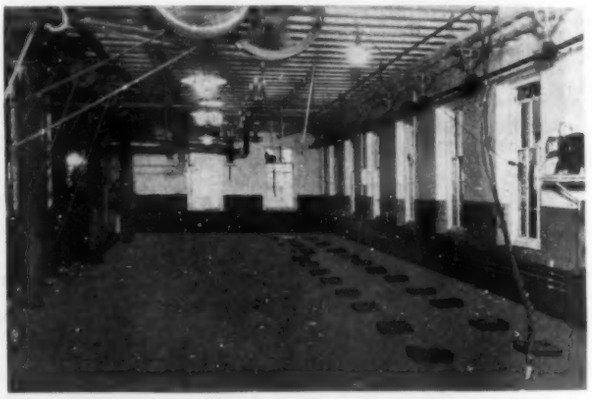
.....

I want information on the following equipment or materials also: .....

.....

Acidproof Flooring

Dyer, Inc., 767 Tenth Avenue, New York, recently installed an acidproof plating room floor at the plant of Joseph



Kabalt Acid-Proof Floor Installed by Dyer, Inc., at Dixon Plant.

Dixon Crucible Company, to replace an old cement slab floor which had cracked in many places and allowed seepage of acid solutions to the floor below. The material used by Dyer for the new floor is known as Kabalt, a mastic material said to be impervious to all acids except hydrofluoric. It is also considerably lighter than cement, and has the added advantage of sufficient flexibility to make it possible for Dyer to guarantee it against cracking or opening despite vibration of the building.

The Kabalt floor at the Dixon plant has an area of 1200 sq. ft., and is built in the form of fourteen shallow saucer-like depressions which cover the whole area. Each "saucer" has a drain at its lowest point. A six-inch curb of Kabalt around the wall bases prevent acid attack of the walls in the event of overflow. The material was laid directly over the old wooden floor.

Dyer reports that similar floors have been laid in various New York area plants during the past eight years, and Kabalt material has been found highly suitable for withstanding water, acid, and other corrosive attack.

Nickel Brightener

A new preparation to be used as an addition agent in nickel plating baths has been developed by the United States Research Corporation, Long Island City, N. Y. The purpose of this agent is to give a brilliantly lustrous finish to the nickel deposit. It is said to be particularly adapted to barrel plating and to eliminate the burnishing operation after plating. It is recommended for irregularly shaped articles, to obtain a bright finish in places which cannot be reached by manual polishing or mechanical burnishing.

The following advantages are claimed: (1) A highly lustrous finish; (2) Improvement of wear resistance of the deposit; (3) Makes the deposit closer grained and thereby improving its protective value; (4) Reducing costs by reducing finishing operations.

Moisture Tester

The Alpha-Lux Company, Inc., 192 Front Street, New York, offers the Speedy Moisture Tester, said to be a simple, reliable and efficient device for determining moisture in a variety of substances, including foundry and other sands, fuel, etc. The outfit consists of a scale sensitive to 5 milligrams, a shaker, and auxiliary equipment. The whole device weighs 13 pounds. The company states moisture contents of most materials can be ascertained in 1 to 2 minutes, at point of operation. Materials can be tested before using or during process. An interesting leaflet is offered, containing a short article, "Why You Should Know the Moisture Content of Your Moulding Sand," by Stephen Stanwarth, mechanical engineer. It also illustrates the tester.

New Tellurium Lead Alloy

The National Lead Company, 111 Broadway, New York, has obtained the exclusive rights to all patents on British developments in the United States and Canada for the production and sale of an alloy containing 0.06 per cent to 0.10 per cent tellurium. The trade name of this alloy is Teledium. These rights also include other lead base alloys prepared with varying amounts of tellurium.

The National Lead Laboratories have substantiated important claims made for this material. It is now being tried in the form of sheet and pipe with very favorable reports. It is said to have much higher resistance to bursting by frost than ordinary lead and also very much higher fatigue and vibration resistance. The grain structure is extremely fine and uniform. The alloy can be "work toughened" and it is stated, can be bent double and hammered flat without fracture in the toughened condition. The sheets can be burned together in the same way as ordinary lead.

One of the outstanding properties of this material is that it withstands, for short periods, the action of boiling concentrated sulphuric acid.

Plating Products Company Takes Larger Quarters

The Plating Products Company, formerly at 348 Mulberry Street, Newark, N. J., have moved to larger quarters at 352 Mulberry Street. The company was established in 1932 as distributors for the Hanson-Van Winkle-Munning Company, Matawan, N. J., to maintain the entire sales and service in the state of New Jersey.

The new location will provide additional space for a more complete stock of plating and polishing equipment and materials, and also a complete line of chemicals, which is being added. It will insure prompt and efficient service within the area of the company's activities. The company anticipates extending the activities of its used equipment department.

The personnel will continue under the direction of C. I. Knecht and M. C. Hoy, who were formerly with Hanson-Van Winkle-Munning. Mr. Hoy formerly served Hanson-Van Winkle-Munning as cleaner specialist, and later took up the general sales activities for New Jersey, while Mr. Knecht was with the engineering department for a number of years, and subsequently was appointed manager of the Philadelphia office.

Skin Protector

Magnus Chemical Company, Garwood, N. J., has placed on the market Skin-Gard, a creamy compound for protecting the hands of workmen. The material is applied before starting work, and is removed by ordinary soap and water washing after work is finished. The maker states it is impervious to grime and grease, and will be found useful in a great variety of industries, including metal working, finishing, electrotyping, etc. It is packed in 12 oz. cans.

Aluminum: A new aluminum mirror devised by scientists at Cornell University was used to catch the invisible "blue rainbows" of ultra violet light made by the stars.

News of Associations

New York Branch

The New York Branch held a special meeting November 10 to discuss the winter schedule. A committee composed of Members Fisher, Mac Stoker and Stremel will gather educational material for the coming meetings, and efforts will be made to obtain technical men to address the Branch.

Winter sessions began with the meeting Friday evening, November 24, which was designated "Charles H. Proctor Night." Mr. Proctor was present and delivered a paper on Faraday's Laws, dealing with the British conception and application of these laws of electrochemistry on which the process of electroplating is founded.

National Founders

National Founders Association met in New York, November 15-16, and heard a program of papers and addresses, chiefly economic, but including the following of technical interest to nonferrous foundrymen:

Control of Dust at the Source, by E. O. Jones, the association's consultant.

Legal Aspects of Dust in Industry, by A. C. Hirth, attorney, Toledo, Ohio.

In the annual election, Thomas W. Pangborn of Hagerstown, Md., was elected president, succeeding S. Wells Utley of Detroit, Mich., who becomes honorary member of the administrative council. F. H. Clausen of Horicon, Wis., was elected vice-president to fill the place left by Mr. Pangborn.

International Heating and Ventilating Exposition

Divided into several broad classifications indicating the type of equipment, fuels, materials, and methods employed in heating, air-conditioning, and ventilating, the Third International Heating and Ventilating Exposition will be characterized by dynamic displays. This type of active display is being developed by practically all the exhibitors in view of the current trend toward making exposition exhibits attractive, informative, and interesting. The Exposition takes place at Grand Central Palace, in New York City, February 5th to 9th, 1933. There will be a number of exhibits of special interest to the metal industries.

American Welding Society

The New York Section of the American Welding Society held an open meeting November 22. The meeting was devoted to a symposium on aluminum, with an exhibition of aluminum products. A general lecture was delivered by Dr. H. V. Churchill, chief chemist, Aluminum Company of America. There were also papers on Arc Welding and Electric Resistance Welding of Aluminum, by D. I. Bohn, and Gas Welding of Aluminum by G. O. Hoglund, both Aluminum Company men. Discussion followed.

Personals

Stevens Celebrates Half a Century of Progress

Frederic B. Stevens, founder and head of the well known foundry and plating equipment and supply firm of Detroit, Mich., is this year celebrating the completion of half a century of progressive and highly successful activity in business.

Mr. Stevens was born and educated

FREDERIC B. STEVENS

in Connecticut. In 1883 he followed one of the prevalent impulses of the times and "went west." Settling in Detroit, he found employment in the foundry industry, holding a number of office positions. He learned the foundry business, then decided to go into business for himself. He chose the sale of pig iron, adding to his line foundry supplies to meet a demand for them from foundrymen to whom he sold iron. The firm prospered, largely through the efforts and progressive ideas Mr. Stevens put into it. Plating and polishing supplies and equipment were added to the firm's stocks. From selling these products, Mr. Stevens went into their manufacture. The sale of refractory brick suggested the development and sale of face brick for ordinary building purposes. It was done, and Stevens vitrified face brick became a great success.

Today, after fifty years of marching forward, the Stevens firm has several large plants and warehouses, as well as general offices, in Detroit; a Canadian company warehouse and plant at Windsor, Ont.; and branches at Indianapolis, Ind., Erie, Pa., New Haven, Conn., and Toronto, Ont.

The company, besides its extensive operations in foundry equipment and supplies, refractories, etc., is a leading manufacturer of automatic electroplating equipment, as well as polishing and buffing lathes and other types of metal finishing equipment. The company also is a large importer of plumbago and other products.

The guiding hand in all this progress has been Frederic B. Stevens, who is president of the Detroit company and also the Canadian affiliate, known as Frederic B. Stevens of Canada, Ltd. He is being congratulated on his half century of success by a host of friends and acquaintances he has made in his extensive business trips around the country.

Charles Stiers

Charles Stiers recently became connected with the Ault and Wiborg Corporation, New York, manufacturers of lacquers and other industrial finishing materials. He will make his headquarters at the Chicago office of the company.

Mr. Stiers was born and raised on a farm in southeastern Ohio. In 1909 he went to work for the Westinghouse Electric and Manufacturing Company at Pittsburgh, Pa. He started in the machine assembly and inspection departments, and advanced first to foreman then to assistant chief inspector of automobile equipment. In 1919 he was transferred with his department to Newark, N. J., where he became assistant superintendent. Later in that year, Mr. Stiers joined the industrial department of the J. B. Ford Company as a salesman. He covered the northern New Jersey and New York City industries using finishing materials. He continued in this field with Ford and other companies for some years, and built up a very large clientele of lacquer users. He went to Cleveland some years ago, and then to Chicago. In the midwest he has had success similar to his eastern experience. He is widely known and very popular in the trade. In his newest connection, Mr. Stiers is meeting with a warm reception and is making excellent progress.

Charles Stiers

R. E. Manning, was appointed November 1st as sales representative for E. Reed Burns Manufacturing Corporation, 21 to 27 Jackson Street, Brooklyn, N. Y., makers of a complete line of polishing compositions and buffing wheels. Mr. Manning will make his headquarters in Pittsburgh, and cover all of Western Pennsylvania and adjoing territory.

Allen DeVilbiss Gutchess

Allen DeVilbiss Gutchess, president of The DeVilbiss Company, Toledo, O., manufacturers of spray painting and atomizing equipment, returned recently from a six weeks' trip to London, where he inspected his company's British plant, and to Paris and Barcelona, where he visited European agents of DeVilbiss.

Mr. Gutchess is the nephew of the late Thomas DeVilbiss, founder of the company, whose secretary he was from 1914 until Mr. DeVilbiss' death, when Mr. Gutchess became president of the company. Commenting on his trip abroad, Mr. Gutchess said:

ALLEN DeV. GUTCHESS

"Business is improving in England, and we have received several promising orders from Italy. Conditions are unsettled in France, and the withdrawal of Germany from the League of Nations was the cause of serious alarm. War is a very present threat in Europe." General Balbo's fleet, in preparation for its epoch-making flight to Chicago, was painted with DeVilbiss spray-painting equipment, Mr. Gutchess revealed.

Robert G. Scott has been appointed vice-president of Revere Copper and Brass, Inc., New York, and will take charge of the Taunton-New Bedford Division, Taunton, Mass., it is announced by C. D. Dallas, president. Mr. Scott has been with Revere since its formation, and previously was with Rome Brass and Copper Company and Baltimore Copper Mills, both now part of Revere. He is wide experienced in fabrication. Recently he has been doing special sales engineering work. Previously he had charge of the Revere rolling mills at Baltimore.

James W. Hook, president of the Geometric Tool Company, New Haven, Conn., has been appointed industrial adviser for the aluminum producing and fabricating industry by the Industrial

Advisory Board, N. R. A., Washington, D. C.

D. J. **Macnaughtan,** director of research for the International Tin Research and Development Council, with headquarters in London, has arrived in New York preparatory to starting a tour of the important manufacturing centers, including Buffalo, Detroit, Toledo, Chicago, Youngstown, Pittsburgh and Philadelphia, as well as Washington, D. C., and Toronto, Canada. He plans to remain in this country at least two month. Mr. Macnaughtan purposes to acquire first hand knowledge of technical progress and manufacturing practices, to the end that the Council's research program may be co-ordinated with American Requirements, and policies developed to insure the greatest possible service to tin consumers.

Walter Hochschild, assistant to the chairman of the board of the **American Metal Company,** New York, is organizing the non-ferrous metals industry in New York for the Citizens Family Welfare Committee campaign which opened November 16, to raise $4,000,000 for welfare agencies in the city.

Walter E. Petersen, formerly with the Magnolia Metal Company is now associated with the Chicago plant of the United American Metals Corporation in the capacity of manager of the babbitt metal department. Mr. Petersen will devote particular attention to the introduction of babbitt metal in bushing form.

Obituaries

Richard B. Mellon

Richard B. Mellon, active head of the Pittsburgh, Pa., family which is a major owner of the Aluminum Company of America and many other industries, died December 1, 1933, aged 75. Among his survivors is Andrew W. Mellon, former Secretary of the Treasury. While Richard Mellon's primary interest was in banking, he held offices or directorships in the Aluminum Company and some of its subsidiaries, as well as in a large number of the other Mellon companies.

During his years as president of the Pittsburgh Reduction Company (now part of the Aluminum Company), Mr. Mellon was especially interested in the metallurgical progress of aluminum. He made it a point to obtain every issue of "The Aluminum World" (now incorporated with **Metal Industry**), and he visited the publication's office, whch was then a mere corner of a printing shop. He was always kindly and courteous to everyone.

Paul D. Hamilton

Paul D. Hamilton, president of the Hamilton Hardware Company, Waterbury, Conn., and a director of the Bridgeport Brass Company, died November 14, 1933. Mr. Hamilton was born sixty years ago in Waterbury, and was graduated in 1894 from the Sheffield Scientific School at Yale. He founded the Hamilton concern in 1903.

Surviving are his widow, a daughter, and two sons, David B. Hamilton of Manchester and Lawrence M. Hamilton of Waterbury.

Louis Kleb

Louis Kleb, 60 years old, a manufacturing jeweler in Newark, N. J., for many years, died at his home in Westfield, N. J., on November 11, 1933, after a short illness.

George Vits

George Vits, president of the Aluminum Goods Manufacturing Company, Manitowoc, Wis., died November 15, 1933, after a year's illness with arterio sclerosis. He was 56.

GEORGE VITS

Mr. Vits was the son of the late Henry Vits, founder of the aluminum fabricating concern which is the largest industry in Manitowoc, and one of the largest in Wisconsin. It has very large plants at Manitowoc and Two Rivers, Wis.

Mr. Vits was influential in politics, and widely known as a philanthropist, as well as being one of the important industrialists of the middle west.

Russell H. Colby

Russell H. Colby, president of the Aurora Metal Company, Aurora, Ill., died last month after a brief illness. He was 67.

Mr. Colby, a graduate of Massachusetts Institute of Technology, went to Aurora 43 years ago. The company he headed at the time of his death was a leading manufacturer of babbitt metals and piston packings, and it has been prominent in development of aluminum bronze die castings.

Mr. Colby is survived by his widow.

Isaac W. Cokefair

Isaac W. Cokefair, vice-president of the International Silver Company, Meriden, Conn., and vice-president of International Silver Company of Canada, Ltd., died November 24, 1933, at his home in New York. He was 73 years old.

Mr. Cokefair began his business career when he was eleven, with Benjamin Lander, retail silverware dealer then on John Street, New York. Later, he opened his own shop on Maiden Lane, not far from the location of the present headquarters of the International company. He was local distributor for the Derby Silver Company, and when, 20 years ago, the Derby company was absorbed in the consolidation which became the International company, Mr. Cokefair became a vice-president and director of the latter, as well as continuing as a retail distributor. He was also interested in numerous other business ventures.

F. A. Russ

Friend Augustus Russ, of Greenwich, Conn., for 40 years president of the Bassett Metal Goods Company, Shelton, Conn., and its predecessor company, died November 9, 1933, in his 76th year.

Mr. Russ was born in Brooklyn in 1858. As a young man he was employed as a salesman for Follmer and Clogg, umbrella manufacturers. In the settling of the estate of a distant relative in Derby, Conn., he became interested in the Bassett Company, manufacturers of corset materials, and with a small capital purchased a controlling interest.

During the war Mr. Russ established a trust fund of $100,000 to help needy working people of Shelton and Derby, Conn. This fund has been of great assistance to the poor of those cities during the depression.

Ole J. Lunde

Ole J. Lunde, pioneer foundryman of LaCrosse, Wis., died October 14, 1933, aged 68. Mr. Lunde was a native of Norway. In 1887 he settled at LaCrosse, and two years later he established a foundry for manufacture of brass, bronze and aluminum castings.

T. D. Lynch

Tillman D. Lynch, aged 66, formerly for over 30 years consulting metallurgical engineer at the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., died last month at Edgewood, Pa., after several months illness.

Industrial and Financial News

Visitors to Last Platers' Convention Are Warned Against Amebic Dysentery

Twenty-five deaths and 368 cases of illness in 118 American cities have thus far been reported as the result of amebic dysentery, a tropical disease, which apparently began to spread in Chicago the past summer, among visitors to the Century of Progress and to conventions held there. A number of cases have been reported among platers and other visitors to the annual convention of the American Electroplaters' Society, held at Chicago last June. Of these, several have already passed away, and some have become seriously ill, among the latter being T. A. Trumbour, business manager of **Metal Industry** and "Platers' Guide", and secretary-treasurer of the International Fellowship Club, who attended the convention. A nationwide campaign has been started by the medical profession to fight the disease. The Chicago Board of Health is making special efforts to acquaint physicians throughout the country with the diagnosis and treatment of the malady. It is particularly anxious to prevent mistaken diagnosis, as treatment can be very effective if correct measures are taken.

The Chicago Health Board has thus far traced over 300 carriers of the disease. Among them were a number of food handlers at a Chicago hotel, and some 16,000 guests of the hotel during the past year have been sent questionnaires regarding their health.

The disease takes either of two forms where it develops, acute or chronic. In the acute form the victim has an attack of nausea or diarrhea, with stomach pain, which lasts a few days, after which it clears up. In the chronic form the disease may linger for years. In some cases it has been confused with other intestinal disorders more common in this part of the world, like ordinary dysentery and colitis, and patients have thus been given the wrong treatment by doctors unfamiliar with the tropical disease, and some have died.

Mr. Trumbour's case is typical. He has been ill intermittently since his return from Chicago, and his illness has only recently been diagnosed as amebic dysentery. When it was finally diagnosed, he was confined to the Paterson, N. J., General Hospital, for specific treatment, and he is now continuing the treatment at home, where he is resting comfortably.

All who have been to Chicago this year, and especially those who attended the platers' convention, are strongly urged, if they have suffered any intestinal trouble like diarrhea, colitis or dysentery, to have further examinations made at once, to see if they are suffering from amebic dysentery. This step is necessary as the treatment for this disease is special and altogether different from that for other disorders which it resembles.

Boston Supply Firms Merge

M. E. Baker Company, dealer in electroplating and finishing equipment and supplies, with main office and warehouse at 79-81 Haverhill Street, Boston, Mass., has acquired the goodwill and complete stock and equipment of the Boston Plating Supply Company, 101 Haverhill Street. Arthur W. Collins, formerly with Boston Plating Supply, will continue with Baker in the same capacity.

The new acquisition gives the Baker company the distribution in the Boston territory of the products of Hanson-Van Winkle-Munning Company, Matawan, N. J., and the Lea Manufacturing Company Waterbury, Conn., large makers of plating and finishing equipment and supplies.

The Baker firm is headed by M. E. Baker, president and treasurer; and I. Baker, secretary.

Reynolds Metal Company

With the purchase from E. D. Coddington Manufacturing Company, Milwaukee, Wis., of the rights, materials and machinery for the manufacture of "Ecod" fabric, the Reynolds Metals Company, New York, has definitely entered the building supplies field. Coddington's raw materials and machinery have been divided and shipped to two of the Reynolds plants at Louisville, Ky., and Glendale, L. I., where the new material, to be known as "Reynolds Metallated Ecod," will be manufactured. "Metallation" is a coined name for aluminum insulation already in manufacture by the Reynolds company.

Superheater Company's Job Foundry Output Expanded

For many years The Superheater Company has been producing bronze castings at its East Chicago, Ind., plant, for its own use, and for other local manufacturers. As a result of increased demand for high-grade, uniform castings, plant and laboratory facilities have now been extended to provide a service on a much broader basis, under the direction of the company's Bronze Foundry Division, it is announced.

The company produces bronze castings, rough or finished, in three classes of mixtures: standard bronzes, aluminum bronzes, and super-tensile manganese bronze.

These are marketed under the trade name "Elesco." The new facilities for producing "Elesco" bronzes are described in the firm's Bulletin B-1, copies of which are available on request.

Metal Products Shown at Hotel Exposition

A great variety of metal products were shown at the eighteenth National Hotel Exposition, held last month at New York. Utensils, naturally, were abundantly displayed, as well as a profusion of hotel equipment in all kinds of metals and finishes. Practically the whole list of exhibitors, except those in food and textile lines, touch in some way on the fields in which readers of this journal operate. Their products include, besides utensils, kitchen, bar and lighting fixtures, metal window frames, decorations, tableware, hollow ware, and various other products in brass, bronze, nickel, and in such plated finishes as nickel, silver, chromium, and in lacquers. Of special interest were the exhibits of the Aluminum Cooking Utensil Company, New Kensington, Pa.; J. B. Ford Sales Company, Inc., Wyandotte, Mich.; and the monel and rolled nickel department of The International Nickel Company, New York.

Platinum Metals Sold by Refiners in 1931-32

Platinum metals sold by refiners in the United States during 1931 and 1932, by consuming industries, in troy ounces, as reported to the U. S. Bureau of Mines:

Industry	Platinum	Palladium	Iridium	Others	Total	Percent of Total
1931						
Chemical	11,483	979	18	64	12,544	11
Electrical	8,215	22,628	609	17	31,469	26
Dental	10,135	9,394	74	13	19,616	17
Jewelry	41,261	2,988	2,185	264	46,698	39
Miscellaneous	5,896	1,934	373	667	8,870	7
Totals	76,990	37,923	3,259	1,025	119,197	100
1932						
Chemical	5,157	495	52	218	5,922	7
Electrical	3,456	6,309	431	23	10,219	12
Dental	8,683	12,900	73	9	21,665	26
Jewelry	33,376	5,817	1,719	314	41,226	50
Miscellaneous	3,896	204	274	27	4,401	5
Totals	54,568	25,725	2,549	591	83,433	100

Business Items---Verified

Servel, Inc., has begun extensions and alterations to its Electrolux refrigerator unit at Evansville, Ind.

Star Aluminum Company, Ltd., will operate a plant for aluminum foil production at Graisley, Wolverhampton, England, employing about 200.

Black and Clawson Company, 2nd and Vine Streets, Hamilton, O., plans reconstruction of its pattern shop and warehouse, destroyed by fire several weeks ago.

Fairchild Aviation Corporation, Farmingdale, N. Y., has an order for six amphibian air liners to cost $217,000, with option in contract for six additional ships.

Pack-Morin, Inc., of 261 Fifth Avenue, New York, designers of automatic equipment, have been retained by the Coco Cola Company, Atlanta, Ga., to design special equipment pertaining to its products.

Japan-Manchuria Magnesium Company has been formed with 7,000,000 yen capital to erect a plant in Japan for treatment of magnesium ore to be imported from Manchuria, as was authorized by Japanese government.

Dover Manufacturing Company, Dover, O., maker of electrical appliances, is building a $40,000 addition to plant, which will materially increase facilities for production of nickel and chromium plated flat irons and other devices.

Central Pattern and Foundry Company, 3737 South Sacramento Avenue, Chicago, Ill., is doubling its capacity by erecting a foundry building 100 x 200 feet for the production of aluminum and bronze castings. Present plant is now on a 24-hour schedule.

General American Transportation Company will build four special aluminum alloy tank cars at its Sharon, Pa., shops. Cars are for carrying chemicals from Union Carbide Company's South Charleston, W. Va., plant, and will be delivered about January 1.

Reidel and Sons Manufacturing Company, New Brighton, Pa., operating a foundry and plating plant, recently lost part of its facilities in a fire. The company states it will carry on in remaining foundry buildings, and will rebuild destroyed part when business permits.

The Falk Corporation, Milwaukee, Wis., announces the appointment of **T. F. Scannell,** formerly St. Louis representative, to the Dallas, Texas territory, to take charge of oil field sales. His office will be at 3519 Rankin Street. St. Louis territory has been taken over by **Fitch S. Bosworth,** 5475 Cabanne Ave.

Tennessee Valley Authority has awarded contract to **Aluminum Company of America,** Pittsburgh, Pa., for 675 miles of steel-reinforced conductor cable for first of two transmission lines from Muscle Shoals. Contract was for $400,149, as against next lowest bid, $678,000 made by copper cable producer.

The U. S. Stoneware Company, 50 Church Street, New York, has appointed **The Merrill Company,** 343 Sansome Street, San Francisco, Calif., to represent it in the sale of chemical stoneware and corrosion-proof equipment in the San Francisco territory, it is announced by **Howard Farkas,** sales manager of the Stoneware company.

Manfred Weiss Steel Works, A-G., Budapest, Hungary, is reported planning new works to cost over $200,000 with equipment, for the production of aluminum and new aluminum products.The new project will be affiliated with the new works of Aluminum Erzbergwerke U. Industrie, A.-G., Budapest at Csepel, which is an interest of Bauxite Trust, A.-G., Zurich, Switzerland.

Pangborn Corporation, Hagerstown, Md., announces the appointment of **Ralph M. Trent** as sales engineer in the Pittsburgh territory, with offices at 604 Chamber of Commerce Building, Pittsburgh, Pa. He was manager of the company's St. Louis office for the past five years, and has had long experience with the company in sale and engineering of sand blasting and dust collecting equipment.

The Mearl Corporation, manufacturers of pearl essence, have now opened their New York office and laboratory at 127 West 20th St., New York City. This laboratory will be in charge of their chemical director **H. E. Mattin.** The factory has been removed to Roselle Park, N. J., where ample facilities are provided for the manufacture of pearl essence, and laboratories for the use of those desiring to work with pearl essence.

Precision Printing Roller Company, Purchase Street, New Bedford, Mass., recently organized by a New Bedford and Taunton, Mass., group, has begun production of a newly patented type of copper textile printing roller. Company is capitalized at $100,000, and is headed by **A. W. Forbes,** president and **F. J. Carroll,** treasurer. The product requires rolled and cast copper and bronze parts, and considerable working, polishing, etc. Present quarters are temporary; permanent plant with full equipment is contemplated.

H. Kramer and Company, Chicago, Ill., nonferrous ingot producer, has appointed **Cambridge Street Metal Company, Inc.,** Allston, Mass., as New England representative. **John D. Nichols,** president of Cambridge Street firm and formerly manager of **Richards and Company,** Boston, will cover the territory. The Kramer company produces ingots of red and yellow brass, bearing metals, manganese bronze, nickel silver, aluminum bronze, aluminum and its alloys, deoxidizers and other special alloys. Metal will be warehoused by the Cambridge Street company.

Millspaugh, Ltd., has acquired premises at the East Hecla Steel Works of Hadfields, Ltd., Sheffield, England, and will carry on manufacturing operations there. **W. H. Millspaugh,** head of the new enterprise, is a well-known American inventor and manufacturer of paper-making and other machinery, who for many years had a successful business at Sandusky, Ohio. He is taking advantage of Hadfields' forging, heat-treating and other facilities, but is laying down his own casting machines with their open-hearth plant, and is erecting a large bronze foundry in an adjacent industry. Millspaugh intends to make the largest bronze tubular castings required in paper-making, shipbuilding and other engineering, including tubes up to 4 feet in diameter and 32 feet long, weighing from 10 to 40 tons. A.B.C.

Start Research in Watch-Making Metallurgy

Battelle Memorial Institute, Columbus, Ohio, has established a research project sponsored by the Elgin National Watch Company of Elgin, Ill., for the study of the metallurgy of watch-making.

A variety of alloys are used in watch parts, but the alloys used have remained the same for many years, and metallurgical advances such as other industries have developed have been singularly lacking. Improvement and standardization of the metal in watch parts are the primary aims of this project.

James L. Gregg and A. W. MacLaren, metallurgists, and Dr. H. W. Russell, chief physicist, will work on this research program.

Sale of Chromeplate, Inc.

The assets of Chromeplate, Inc., New York, assignor to Samuel Chassy, were sold at public auction November 29. The assets consisted of accounts receivable, debts due, patents and patent rights, and filing equipment. Jacob Eichel, 11 West 42nd Street, New York, is attorney for the assignee.

New Incorporations

Stirrup Metal Products Corporation, Newark, N. J.; to manufacture metal products; $25,000. Will operate stamping, lacquering and japanning departments.

Myers-Wilson Manufacturing Company, Sioux City, Iowa; metal products; $10,000; **C. H. Myers,** president; **W. W. Wilson,** v-p. and treasurer. Will operate brass machine shop, stamping, tinning, soldering, brazing, lacquering departments.

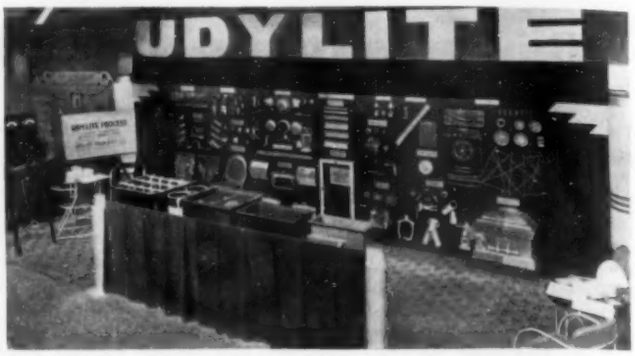
Metal Developments

Copper: A western high school used paper-thin copper sheets for graduates' diplomas recently, according to Copper and Brass Research Association. Roofs and window displays are other uses of the material.

Aluminum: Great Britain's electricity transmission scheme, called the "Grid", is completed. Into it have gone about 12,000 tons of aluminum wire, £14,700 worth of copper and some 150,000 tons of steel, the last mostly galvanized.

Cadmium Exhibit Tells the Public About Plating

This exhibit of cadmium plating, including tanks for cleaning and plating in full operation (see left center of photo), was a great success at the recent National Metal Exposition, says the Udylite Process Company, Detroit, Mich. Visitors were numerous, and the metal using public was given useful information on plating. Stress was laid on the increasing importance of plated finishes in modern manufacture. The great interest of the visitors in the educational features of the display was indicative of how little the public (including many manufacturing men) knows about plating in detail.



N. R. A. Codes

National Galvanizers Association has worked out a supplemental code for the galvanizing branch of the metal products industry, already operating under the code of the Fabricated Metal Products industry. Details of the galvanizers' code follow the other, generally, with basic work week maximum of 40 hours and 40c per hour wage minimum, and certain modifications in the general code to suit the galvanizing industry where it differs radically from other metal working. It was stated that the Association now represents about 70% of the nation's job and commercial plant capacity. Stuart J. Swenson of Pittsburgh is secretary of the Association.

Brass Ingot Statistics

On November 1, unfilled orders from brass and bronze ingots and billets on the books of the members of the Non-Ferrous Ingot Metal Institute, Chicago, Ill., amounted to a total of 13,678 net tons, as compared with 14,065 tons October 1.

The combined deliveries of brass and bronze ingots and billets by the members of the Institute for October amounted to 3,764 tons, as compared with 4,386 tons delivered in September.

Average prices per pound received by the Institute members on commercial grades of six principal mixtures of ingot brass during the twenty-eight day period ending November 3, 1933, are as follows, with comparative prices reported for the period ended October 6:

Grade	28 Days Ended Nov. 3	Oct. 6
Commercial 80-10-10	9.338c	10.028c
Commercial 78%	7.773c	8.250c
Commercial 81%	7.603c	8.482c
Commercial 83%	8.357c	8.752c
Commercial 85-5-5-5	8.508c	9.005c
Com. No. 1 yellow	6.728c	7.268c

News From Metal Industry Correspondents

New England States

Waterbury, Connecticut

December 1, 1933.

There has been a slight recession in business in the local factories during the past month, as evidenced by a number of men laid off weekly who have come back on the rolls of the Mutual Aid, the public relief organization. This has been the first month since April that the trend has not been toward a reduction in the relief rolls.

John H. Goss, vice-president of the **Scovill Manufacturing Company,** was reelected vice-president of the Manufacturers Association of Connecticut at the annual meeting last month.

The Jewish boycott of German goods is helping local manufacturers of toys and metal parts for toys. This has been especially noted by the **Waterbury Button Company,** which makes a walking doll. **Warren F. Kaynor,** president, recalls that the concern got started in toy-making back in the depression of 1892, when it started making a climbing monkey. This enabled the firm to put many people back to work. Aluminum tractors, Zeppelins and airplanes, motored toy speed boats, gliders and thrift banks are beng manufactured by local factories, and many orders are being received here from toy makers elsewhere for spring-wound motors and other metal parts for toys.

The boycott has also helped the **Waterbury Tack Company,** it was brought out in the receivershp hearing on that concern last month. Officials of the firm said that the business of the firm is now much improved as a result. Because of this the judge continued the temporary receivership rather than acceding to the wish of some of the creditors that the concern be put into bankruptcy.

J. Edward Peterson, president of the **Waterbury Lock and Specialty Company,** refuses to confirm or deny the report that the company is planning to move to Milford. He states that he, personally, has purchased the factory plant in that town formerly occupied by the **Reeves Manufacturing Company,** which has about 25,000 square feet of floor space. It was reported in Milford by the former owner that the local concern intended to open for business there shortly, and would have an annual payroll of over $100,000.

Rumors of a prolonged shutdown of the **Waterbury Clock Company** are denied by **James R. Sheldon,** general manager, but he admits that except for the finishing departments the plant will be shut down from November 29 to December 18, and after a week's work, will be closed again from December 22 to January 18, a total of 46 days. He said that the company is at the top of its business peak right now, but the business always slows down around Christmas and for a time after. The concern has been running at a tremendous gait, he said, and for that reason the 2,500 employees will notice the annual shut-down more than usually. It has just matched the production of the "Mickey Mouse" watches, which carry a figure designed by Walt Disney, with "Three Little Pigs" watches, carrying figures of the pigs and the wolf, also designed by Mr. Disney. Both items are very popular with the public.

Directors of the **Scovill Manufacturing Company** have postponed action on the dividend due January 1st until after that date, as dividends declared after that date are not subject to the 5% federal tax.

The Chase Brass & Copper Company has developed a line of soldier lamps for

children's bedrooms. The soldier's likeness appears on the bulb, and the hat is adjustable as a shade. W.R.B.

Connecticut Notes

December 1, 1933.

HARTFORD—Earnings received this year by **Colt's Fire Arms Manufacturing Company** on business contracted and produced in former years but not received until this year will be distributed to stockholders in the form of an extra dividend of 25 cents a share and to employees in the form of cash amounting to 2% on their salaries or wages for the year. The directors decided this at the meeting last month and also voted the regular quarterly dividend of 25 cents a share payable December 30. Approximately 1,500 employees will participate.

Underwood Elliott Fisher Company declared dividend of 25 cents a share, payable December 30, placing the stock on a $1 annual basis, against previous rate of 50 cents.

NEW HAVEN—**E. Kent Hubbard,** president of th **Manufacturers Association of Connecticut,** declared at the annual meeting here last month that the attitude of the national Administration toward industrialists must change "if we are to emerge from this depression, and if we are to build solidly and firmly under the new deal." He charged the industrialist is being ignored during code hearings.

A. C. Gilbert Company, toy makers, finds its sales volume 35% ahead of last year, due partly, it is believed, to the Jewish boycott of German goods.

BRIDGEPORT—A contract for the supply of 400,000 wire rope clips, U-bolts, saddles and 300,000 nuts for army engineering work at Memphis, Tenn., has been approved for award to the **Bridgeport Brass Company** by the War Department.

Lindstrom Tool and Toy Company reports increased business in Christmas toys. It is now employing 400 hands; 200 were added last month. It is experiencing trouble in getting orders out in time for Christmas.

NEW BRITAIN—**Stanley Works** has developed a new tool for cutting, beveling and grooving fibre board products. Another development is a screw driver for the automobile trade, particularly adapted for testing spark plugs. It contains a neon tube in a transparent handle which flashes red, and from the intensity and frequency of the flashes the condition of the plug can be determined.

Fafnir Bearings Company, New Britain Machine Company and **Goss and DeLeeuw Machine Company** expect to benefit by recognition of Russia. They have already done business through the **Amtorg Trading Corporation,** and are now preparing to fill orders received from them. **Stanley Works** and **Landers, Frary and Clark Company,** expect to benefit indirectly.

MERIDEN—**Bassick Company** has tooled up for production of a mechanical toy automobile invented by a New York man, to be sold for $250. About 50 employees have been added, and deliveries are expected to start after Dec. 1. The toy embodies a power unit, a gear shift and directional control. The company is controlled by **Stewart-Warner Company.**

Payroll figures for October, according to the Manufacturers Association, showed a gain of $40,000 in wages, and an increase of 300 employees in the 28 principal factories as compared with the previous month. The factories now employ over 5,000 persons.

DERBY—**Friend A. Russ,** formerly principal owner of the R. N. Bassett Co. of this place, makers of metal articles, died in Greenwich, November 9. When he took the company it employed but 15 people, and he built it up to be the largest maker of wire for women's corsets in the world. When whalebone supplanted wire the factory was turned over to the making of metal goods, chiefly luggage hardware. Mr. Russ was 76 years old, and is survived by his wife, the former Ada Spencer of Worcester, Mass; a daughter, Mrs. Helen Warren of Greenwich; and a son, John B. Russ of Shelton.

WINSTED—Local citizens, within 48 hours, subscribed the $10,000 sought locally by the Winsted Recovery Committee, Inc., taking stock in exchange. Federal aid to the amount of $250,000 will be sought. The initial purpose of the corporation is to assist the **Gilbert Clock Company,** now in receivership. The latter is operating with 460 employees, and has a weekly payroll of $8,000. It seeks to remove existing handicaps due to the receivership which is a cause for unrest among the employees, and a hindrance to the company's business volume. The company has been showing profits for some time.

THOMASTON—**Seth Thomas Clock Company** and **Plume and Atwood Company** closed from Thanksgiving day until the following Monday.

BRISTOL—**Roy T. H. Barnes,** president of **Roy T. H. Barnes and Company,** has resigned as a director of the **Bristol Brass Corporation.**

WALLINGFORD—Directors of **R. Wallace and Sons,** silverware manufacturers, have elected vice-president **Charles D. Morris** as president, succeeding **Frank A. Wallace,** whose death was noted last month W. R. B.

Western Massachussets

December 1, 1933.

There has been slight change in the number of employees of the 26 metal working establishments in this section. Several companies have cut their staffs and others have increased the number of workers on the payrolls or indications are that they will within a few weeks. In certain companies there has been no change in the number of persons on the staff, and in general conditions are as good as they have been for several months if not slightly better.

A general layoff of employees at the **Wico Electric Company** took place this week, with the assurance that as soon as business warrants it, the men will be returned to their jobs. Plant officials were reluctant to say when there might be a pickup in orders, but they indicated that as soon as there were any signs of a pickup the men would be called back to the plant.

More than 100 employees of the **Perkins Machine and Gear Company** have been laid off within the past few weeks because of the seasonal sales decline. Officials said that this is the time of the year when such a drop is to be expected, and they could not say when the next change might be, or when employment might resume a higher level. During the past few months the employment level in this establishment has been the highest for several years.

Westinghouse Electric and Manufacturing Company's works in Chicopee Falls, which has been at an extremely low production level with only about 50 workers employed is looking for great improvement as a result of expiration on Nov. 21 of their agreement with **Radio Corporation of America.** At that time the company regained the liberty of resuming production on its own account. Just prior to Nov. 21 this plant started limited production of short-wave police transmitters. It is expected that early in December production of other radio lines will start. It is also hoped the plant will be successful in bidding on room cooling work soon to be authorized by the company, and plant officials hope for Government contracts for radio beacon control equipment. Recently there had been some discussion relative to closing the Chicopee Falls plant and transferring operations to some other plant, but following the strike tieup of several weeks ago the tendency has been to minimize the possibility of such action being taken. Since settlement of labor differences at the East Springfield plant, refrigeration production is reported proceeding in fair volume in preparation for spring orders. Output in small electrical appliances for domestic use for immediate delivery is also reported as being on the upturn.

Sharp advances in the value of European currencies, especially the pound sterling in relation to the American dollar, has so much increased the cost of imports to **Rolls-Royce of America, Inc.,** that the problem has become serious for the local company, reports **Henry S. Keyes,** president-treasurer of the concern, which imports chasses from England. He said the company will continue to make deliveries on schedule, but will tend to delay imports and await more favorable exchange. He implied a reduction in workers' pay might result.

A large Pennsylvania concern engaged in making taps, dies, drills and other small tools has been looking at several properties here. It is understood the firm wishes to acquire a building to include 50,000 square feet of floor space or thereabout, either by purchase or long-term lease. G. B. Y.

Middle Atlantic States

Central New York

December 1, 1933.

The general fall report for the Rome area was good, although a pre-holiday lag was noticeable in a number of industries in that area. Officials in the Copper City were pleased by the early fall spurt in business.

Utica Cutlery Company is experiencing quickened business because of Christmas trade; **Savage Arms Corporation,** according to the Industrial Association is experiencing a pickup.

The general business picture among all Utica industries for the past three weeks has been less optimistic than the preceding period.

Bradford H. Divine, head of **Divine Brothers Company,** Utica, says his company is noting a marked increase in business all over the country, and that the rise is being reflected in the volume of business being done at their plant, manufacturing, buffing and polishing equipment. "Manufacturers are now confident of the upturn," he said. "They are buying expensive machinery which will last them for many months, and I do not believe they would be making these expenditures, if they did not feel that the worst of the bad days are pretty much over."

Workmen of the **Bossert Corporation,** Utica, favor a national outside union, in preference to a company union, for the purpose of collective bargaining. More than 300 cast votes on the question.

A non-tarnishing mixture or alloy invented by **William S. Murray** of Utica, and **Daniel Gray** of Oneida has been protected by a patent. The alloy is assigned to the **Oneida Community, Ltd.,** for manufacturing purposes. It is described as a "non-tarnishing mixture or alloy consisting of silver, indium and a color modifying metal selected from the group of gold, palladium, cadmium and copper, the silver constituting more than 50 per cent by weight of the total alloy, the indium and color-modifying metal constituting substantially the entire remainder, the amount of indium present being in excess of the amount of color modifying metal present."

A handle attachment for a sheet metal burial case and a new type of burial vault have been perfected by **John D. Canedy** of Oneida, who has been awarded patents which he has assigned to the **Maxwell Steel Vault Company,** Oneida.

Announcement has been made by an inter-company manufacturing and sales agreement between **Remington Rand, Inc.,** and **A. N. Russell and Sons Company,** Ilion, whereby the museum case activities of both concerns are to be co-ordinated. For many years Remington-Rand and its predecessor, **Library Bureau,** made most of the cases used by the leading museums of the country. They are plate glass with bronze frames. Under the new arrangement, Russell will make both the "Russell-Built" and the "Library Bureau" cases, and the sales will be handled by Remington Rand. **E. W. W. Hoyt,** who has been general manager of the museum case sales for Russell, will occupy a similar position with Remington Rand. The consolidation is expected to effect economies.—E. K. B.

Trenton, New Jersey

December 1, 1933.

Crescent Insulated Wire and Cable Company, is setting up an addition to its plant in East Trenton, 30 by 100 feet, one story, steel frame construction. The company is busy at the present time.

Two former employees of **Superior Zinc Corporation,** Bristol, Pa., have filed $50,000 suits for damages against the concern in Common Pleas Court, here. Davis Robinson of Trenton, who had been employed by the company for five years, claims that he inhaled dust particles and fumes to the extent that his health had become impaired. A similar claim is made by John Facon of Bristol.

Magnetic Pigment Company is very busy.

Trenton Brass and Machine Company is operating normally.

New Jersey Incorporations

Mutual Mill Supply Compaany, Union City; metal products; 2,500 shares.

Continental Products, Inc., Newark; manufacture metal goods; 24 shares.

Ascione Electro-Plating Corp., Newark; $125,000.

Wedlake Aluminum Company, Inc., Newark; foundry; $10,000.

Colonial Metalizing Company, West New York; metalizing; 100 shares.

Jewelers' Specialty Company, Newark; manufacture jewelry; 100 shares.

C. A. L.

Newark, New Jersey

December 1, 1933.

Amersil Company of New York, manufacturers of American fused silica and quartz products, has purchased the plant on Coit Street, Hillside, originally constructed by the **Sweet Foundry Company,** and later sold to the **General Brass Foundry Company.**

Halsey Distributing Company, pioneers in the automotive electrical equipment field, will re-enter radio automotive business after retirement of two years. The concern has leased a building on Halsey Street.

Grasselli Chemical Company, Linden, N. J., will erect a new pump house to cost $15,000. C. A. L.

Middle Western States

Detroit, Michigan

December 1, 1933.

Industrial activities here have declined the past month. To some extent this is seasonal, but the greatest retarding force has been strikes, which have now been largely eliminated, although there still are rumblings of dissatisfaction.

Parker Rust Proof Company is planning to erect an addition to its plant and make alterations that will considerably add to its production capacity, it is announced.

The much-discussed Ford-Johnson battle over the NRA code seems to have subsided. Officials of the Ford organization declare that in order to comply with their interpretation of the automobile code, weekly layoffs had to be instituted in the Dearborn, Mich., plant to bring the workers within the maximum of 35 hours weekly as specified by the code. They are accomplishing this end, officials say, by laying off 9,000 men for a seven-day period, to be followed the ensuing week by laying off 9,000 other workers until the entire force is brought within the 35-hour weekly average. The Ford plant previously had been employing about 45,000 workers on a five-day week, eight hours daily, or a total of 40 hours weekly.

R. B. Marshall, vice-president and general manager of **Electromaster, Inc.,** reports September shipments by his company were greater than any month since 1931.

Mueller Brass Company, has set up a new sales organization, **Streamline Pipe and Fittings Company.** This concern controls and owns patents on a fitting for pure copper pipe for plumbing, providing leak-proof joints.

Definite announcement that the **Copeland Refrigeration Corporation** will continue operations at Mt. Clemens, and maintain its line of commercial and household electric refrigerators for the national market, has been made by **E. A. Costa,** representative of **Winslow, Baker, Meyering Company,** Detroit, which purchased the business last September.

Leonard Refrigerator Company, Grand Rapids, a division of **Kelvinator,** is planning to employ 700 more workers during December, according to a recent announcement. The tool and die plants now are rushed getting ready for the 1934 business. Resumption of two assembly lines necessitates the additional employment, it is stated, but only former employees are being engaged.

F. J. H.

Toledo, Ohio

December 1, 1933.

Manufacturers of non-ferrous metal products are ending the year in a better position than 12 months ago. At present, however, production has slowed up in accordance with the usual trend of the season. Industrial activity will be

more or less irregular until after the first of the year.

Motor car production will show no material progress until the new models begin to appear. Accessory plants at present are simply marking time.

Moderate activity continues in the plating plants. Unlike some of the Great Lakes industrial centers, this production here is not limited to motor car requirements.

Unemployment has increased extensively of late, and probably will be a problem for many weeks. Money also is scarce, and buying generally is limited largely to immediate requirements.

Bondholders representing the National City Bank of New York, as trustee have asked the Federal Court to discharge receivers who have been in charge of the **Willys-Overland Company,** automobile manufacturers since last February. Bondholders also have asked that property and business be restored to the company. This is an answer in the equity case brought by the **Monroe Auto Equipment Company** on behalf of creditors to preserve the property as a going concern pending reorganization.

F. J. H.

Chicago, Illinois

December 1, 1933.

Local tool and die makers in this district have benefited by the recently concluded seven weeks strike in 200 Michigan jobbing plants, orders for these plants having been forwarded to many Illinois concerns.

Chicago concerns are expecting to get their share of anticipated export business, due to recognition of Soviet Russia to step up their orders.

Electric refrigerator and radio manufacturers continue capacity production, being among the bright business spots locally.

Decision of most of the automotive exhibitors to be represented at the Century of Progress when it re-opens next year with exhibits in many instances more extensive than in 1933, is indicative of the business stimulus resulting from their exhibits.

An aluminum street car built by the **Pullman Company** will be in operation shortly on the Chicago Surface Lines.

Breweries continue to multiply, and existing companies to increase plant facilities. **Atlas Brewing Company** plans immediate improvements and additions amounting to $500,000.

Among new incorporations are the following: **Power Pack Piston Company,** 1841 West Jackson Boulevard; **Strade Electric Company,** 5303 Lake Park Avenue, manufacturers of radio equipment and musical instruments.

All production departments of the **Nash Motor Company,** Kenosha, Wis., were closed from November 8 to 23 as a result of a wage dispute, retarding production and throwing 3,000 men out of employment.

Business of the **Underwood-Elliott-Fisher Company** in the Chicago district has been 55% in excess of the same period last year, according to **F. C. Snow,** district manager. **Remington-Rand, Inc.,** and **International Business Machines Corporation** also report substantial increases in the Chicago territory.

Studebaker production is increasing to meet increased business. Shipments of 4208 1934 Studebakers to domestic dealers during the first half of November exceeded previous records for several years. Biggest November export business since May, 1929 is anticipated. Orders now on hand assure sales of more than 7,500 cars.

R. G. K.

Pacific States

Los Angeles, Calif.

December 1, 1933.

Burbank, Calif., plant of **Lockheed Aircraft Company** has increased its employment by 600% the past six months, according to **R. H. Gross,** treasurer. Over 85% of the men are skilled mechanics.

S. G. Read is building an all-metal house in the 6100 block on Easton Avenue, East Los Angeles.

Swing Spout Measure Company here is enlarging its facilities for manufacture of lubricating oil dispensers, according to **Hal D. Rives,** manager.

Paul Jacka, chief engineer of the **Mueller Company** plant at Decatur, Ill., has been here for some time, supervising installation of $100,000 worth of machinery in the new Mueller factory at 2801 East 12th Street. It will produce plumbers' brass goods, valves, etc., employing 200. Later the plant may be doubled in size, which would bring the investment at $500,000.

Kittle Manufacturing Company here has a contract to make 113,000 sets of auto license plates for Arizona, at 16¾ cents for copper plates and 10¾ cents for steel plates.

Consolidated Aircraft Corporation of Buffalo, N. Y., will erect a new plant on Lindbergh Field, under 50-year lease. Plant will produce civil and military planes, employ 1,000, and have annual payroll of $1,800,000. **R. H. Fleet** is president.

P. E. Keeler and **Guido Nelli** operate the **California Art Bronze Foundry Company** here, specializing in fine art work.

Cecil F. Clark, 5219 South Hoover Street, Los Angeles, has invented a new dress fastener which does away with hooks and eyes, and has started a factory to make the new product, for which plenty of orders are said to be on hand.

Other Western Notes

B. W. Norton Manufacturing Company's lacquer plant at East Oakland, Calif., burned recently with loss of $100,000. They had a contract for auto license plates, which will be materially delayed.

Continental Can Company is erecting a factory at 615 Orchard Street, Seattle, to cost $120,000. A large plant is also going up at San Jose, Calif., and another at Houston, Texas.

Simplicity Appliance Company, 177 Stillman Street, San Francisco, is making a special type of faucet connections.

H. S.

Metal Market Review

December 1, 1933.

Despite governmental and other efforts to raise prices of basic commodities, the metals last month remained practically static, and the averages of prices for the metals produced in this country (except gold and silver) were lower than they were in October. The imported metals—tin, antimony, platinum, etc.—were higher, which is to be expected in view of the exchange situation, which in turn hinges on the gold price, which also was considerably higher in November than the previous month. Aluminum and nickel, as usual, showed no change.

Copper hardly fluctuated. It ended October at 8 cents delivered Connecticut for electrolytic, and held there until Nov. 10, when it went up ¼ cent, and the 8¼ cent price remained in effect the rest of the month. Business was very light throughout the month.

At the end of the month a code had not yet been accepted by the industry, although it was hoped that the committee would get one together before long, for fear the N.R.A. would impose one.

Lead—Up to the 29th of the month the price of lead held at 4.15 cents St. Louis, then it dropped to 4.02½-4.05 cents for a day, and after the holiday went down to 3.95. Good sales were reported by the trade, the battery makers providing most of the demand, and pigment makers also taking fair quantities.

At this date it is expected action will be taken within a very short time on the lead code, which is still pending.

Zinc—Early on the month prime western zinc declined from 4.75 cents to a basis of 4.50 cents St. Louis, where it remained the rest of the period. Demand was by no means heavy, but there was no tendency by producers to force metal for sale at any shaded prices.

It is now expected that some action will result from a hearing on a zinc code which is scheduled for December 8.

Tin—The trend in tin was steadily

upward most of the month, and the price was as high as 55.80 cents at one time. Demand for metal was fair, though not especially heavy. Tin plate mills were reported buying metal in advance, and there was expectation of an advance in tin plate prices. The metal closed for the month at 53.25 cents.

Aluminum remained unchanged in price throughout December. Of chief interest was the difficulty over the N.R.A. code for this industry. At this writing there is some liklihood that the government will impose a code of its own construction on the industry, as the several factions in the industry appear unable to settle the matter. The N.R.A. declared that the Aluminum Company of America, which, it said, controls 98% of the American aluminum industry, had refused to accept a code containing the fair trade practices demanded by the rest of the industry, which comprises only 2% of it. It was thus considered unlikely that the industry would agree on a code of its own devising, and there was a definite statement by General Johnson that he was prepared to impose a code prescribing wages, hours, and other labor conditions.

Antimony began to rise from the 6.70 cent price on Nov. 10, going to 7 cents for a day, then to 7.20 the next day, and 7.25 the next, Nov. 14. It then remained unchanged the balance of the month.

Silver was strong in price from the beginning of November to the 14th, when it touched 45 cents. After some fluctuation around that level, it tapered off the balance of the period, and held at 43⅛ cents at the close. There was a good deal of speculation, due to the monetization ideas that are current, and also as a result of inflationary expectations.

Gold continued to go higher under the government's policy of setting a price daily. Reference to the table at the foot of this page will show the daily prices, and also the average.

Platinum and its associated metals went higher last month. The platinum cash price was advanced $2 to $38 on Nov. 8, where it held the balance of the month. The alloys were advanced proportionately.

Other metals—Bismuth was raised to $1.30 in November, an advance of 10 cents. Quicksilver was higher on the month, being quoted now around $69 a flask.

Scrap metals—There were no very important changes in the price list. Offerings of metal were limited most of the month, due to weakness in the new metal markets and exchange uncertainties. A few of the copper and brass grades were slightly lower on the month. Pewter scrap went up, as did the nickel and monel grades.

Prices of all metals and fabricated products will be found on the next page.

The Wrought Metal Market

December 1, 1933.

Prices of fabricated metal products remained unchanged throughout the month of November, there having been no radical change in base metal prices, except those which are imported, such as tin, antimony, silver and the platinum metals and alloys. The differentials on the tin products remained the same, but prices were higher due to the advancing price of tin. Some of the ingot metals were somewhat stronger in price, due to minor advances in some of their components, such as tin and antimony.

The demand for metal products has tapered off somewhat, due to relaxation in operations of plants producing articles which go into large sale at Christmas. These plants, of course, were busy for a considerable period in the past few months.

The automobile industry, largest single consumer of nonferrous metal products, is in a lull now, with arrangements going through at most plants for new models. Much of the automotive activity depends upon the effect the coming national and other automobile shows will have on the public. Automobile production in 1933 reached its peak in June, when the United States and Canada produced 260,645 cars and trucks. The figure continued high for the next three months, July's total being 239,628, August's 242,566, and September's 201,890. The figure dropped to an estimated 150,000 in October, the last month for which the figures are available now. The October estimate, however, compares with 51,625 for that month last year, which shows the surprising increase in automotive business that occurred in 1933. This was reflected in metal business. The outlook for the future, according to automotive industry's leaders, is good.

The electrical business, another large metal consumer, has apparently turned upward in the past few months. For the third quarter of 1933 Westinghouse reported the largest sales bookings of any quarter since 1931, and its unfilled orders Oct. 1 amounted to $28,508,000.

Daily Metal Prices for November, 1933

Record of Daily, Highest, Lowest and Average Prices and the Customs Duties

	1	2	3	6	7*	8	9	10	13	14	15	16	17
Copper c/lb. Duty 4c/lb.													
Lake (Del. Conn. Producers' Prices)	8.125	8.125	8.125	8.125	....	8.125	8.125	8.375	8.375	8.375	8.125	8.375	8.375
Electrolytic (Conn. Producers' Prices)	8.00	8.00	8.00	8.00	....	8.00	8.00	8.25	8.25	8.25	8.00	8.25	8.25
Casting (f.o.b. ref.)	7.75	7.75	7.75	7.75	....	7.75	7.75	8.00	8.00	8.00	7.75	8.00	8.00
Zinc (f.o.b. East St. L.) c/lb. Duty 1¼c/lb.													
Prime Western (for Brass Special add 0.05)	4.75	4.70	4.50	4.50	....	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Tin (f.o.b. N.Y.) c/lb. Duty Free													
Straits	49.00	49.75	49.85	49.90	....	51.50	53.50	53.25	53.75	54.85	55.50	55.00	53.50
Lead (f.o.b. St. L.) c/lb. Duty 2½c/lb.	4.15	4.15	4.15	4.15	....	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
Aluminum c/lb. Duty 4c/lb.	23.30	23.30	23.30	23.30	....	23.30	23.30	23.30	23.30	23.30	23.30	23.30	23.30
Nickel c/lb. Duty 3c/lb.													
Electrolytic 99.9%	35	35	35	35	....	35	35	35	35	35	35	35	35
Antimony (Ch. 99%) c/lb. Duty 2c/lb.	6.70	6.70	6.70	6.70	....	6.70	6.70	7.00	7.20	7.25	7.25	7.25	7.25
Silver c/oz. Troy Duty Free	40.00	40.875	40.25	41.50	....	41.875	42.875	42.75	43.75	45.00	44.75	45.00	44.625
Platinum $/oz. Troy Duty Free	36.00	36.00	36.00	36.00	....	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00
Gold—R. F. C. Official Price—$/oz. Troy	32.26	32.36	32.57	32.84	32.84	33.05	33.15	33.20	33.45	33.56	33.56	33.56	33.65

	20	21	22	23	24	27	28	29	30*	High	Low	Aver.
Copper c/lb. Duty 4c/lb.												
Lake (Del. Conn. Producers' Prices)	8.375	8.375	8.375	8.375	8.375	8.375	8.375	8.375	....	8.375	8.00	8.225
Electrolytic (Conn. Producers' Prices)	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25	....	8.25	8.00	8.156
Casting (f.o.b ref.)	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	....	8.00	7.75	7.906
Zinc (f.o.b. East St. L.) c/lb. Duty 1¼c/lb.												
Prime Western (for Brass Special add 0.05)	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	....	4.75	4.50	4.521
Tin (f.o.b. N.Y.) c/lb. Duty Free												
Straits	55.00	55.50	55.80	54.00	53.00	52.25	53.25	53.25	....	55.80	49.00	53.070
Lead (f.o.b. St. L.) c/lb. Duty 2½c/lb	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.05	....	4.15	4.025	4.145
Aluminum c/lb. Duty 4c/lb.	23.30	23.30	23.30	23.30	23.30	23.30	23.30	23.30	....	23.30	23.30	23.30
Nickel c/lb. Duty 3c/lb.												
Electrolytic 99.9%	35	35	35	35	35	35	35	35	....	35	35	35
Antimony (Ch. 99%) c/lb. Duty 2c/lb.	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	....	7.25	6.70	7.070
Silver c/oz. Troy Duty Free	44.25	44.50	44.75	43.375	42.875	42.00	43.00	43.375	....	45.00	40.00	42.974
Platinum $/oz. Troy Duty Free	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	....	38.00	34.00	36.725
Gold—R. F. C. Official Price—$/oz. Troy	33.66	33.76	33.76	33.76	33.76	33.76	33.85	33.93	....	33.93	32.26	33.156

* Holiday.

Metal Prices, December 4, 1933

(Import duties and taxes under U. S. Tariff Act of 1930, and Revenue Act of 1932)

NEW METALS

Copper: Lake, 8.125, Electrolytic, 8.125, Casting, 7.75.
Zinc: Prime Western, 4.75. Brass Special, 4.80.
Tin: Straits, 49.00. Pig, 99%, 47.50.
Lead: 4.15. Aluminum, 23.30. Antimony, 6.70.
Nickel: Ingot, 35. Shot, 36. Elec., 35. Pellets, 40.
Quicksilver: Flask, 75 lbs., $67. Bismuth, $1.20.
Cadmium, 55. **Silver,** Troy oz., official price, N. Y., Dec. 4, 43.12½. **Gold:** oz., Troy, Official U. S. Treasury price December 4, $34.01.
Platinum, oz. Troy, $36.00.

Duties: Copper, 4c. lb.; zinc, 1¼c. lb.; tin, free; lead, 2½c. lb.; aluminum, 4c. lb.; antimony, 2c. lb.; nickel, 3c. lb.; quicksilver, 25c. lb.; bismuth, 7½%; cadmium, 15c. lb.; cobalt, free; silver, free; gold, free; platinum, free.

INGOT METALS AND ALLOYS

	Cents lb.	U. S. Duty	Import Tax*
Brass Ingots, Yellow	6½to 8	None	4c. lb.[1]
Brass Ingots, Red	8to10½	do	do
Bronze Ingots	9to11½	do	do
Aluminum Casting Alloys	13 to22	4c. lb.	None
Manganese Bronze Castings	20 to34	45% a. v.	3c. lb.[2]
Manganese Bronze Forgings	26 to38	do	do
Manganese Bronze Ingots	8½to12½	do	4c. lb.[1]
Manganese Copper, 30%	11½to16	25% a. v.	3c. lb.[2]
Monel Metal Shot or Block	28	do	None
Phosphor Bronze Ingots	8½to12	None	4c. lb.[1]
Phosphor Copper, guaranteed 15%.	13¼to17	3c. lb.[2]	do
Phosphor Copper, guaranteed 10%.	12¼to16	do	do
Phosphor Tin, no guarantee	61to75	None	None
Silicon Copper, 10%	18 to30	45% a. v.	4c. lb.[1]
Iridium Platinum, 5%	$39.25	None	None
Iridium Platinum, 10%	$40.50	None	None

*Duty is under U. S. Tariff Act of 1930; tax under Section 60 (7) of Revenue Act of 1932.
[1]On copper content. [2]On total weight. "a. v." means ad valorem.

OLD METALS

Dealers' buying prices, wholesale quantities:	Cents lb.	Duty	U. S. Import Tax
Heavy copper and wire, mixed	5⅞to 6⅛	Free	4c. per pound on copper content.
Light copper	5⅛to 5⅜	Free	
Heavy yellow brass	3⅜to 3⅝	Free	
Light brass	2⅞to 3	Free	
No. 1 composition	4⅝to 4⅞	Free	
Composition turnings	4⅜to 4⅝	Free	
Heavy soft lead	3⅛to 3⅜	2⅛c. lb	
Old zinc	2½to 2¾	1⅝c. lb.	
New zinc clips	3⅜to 3⅝	1½c. lb.	
Aluminum clips (new, soft)	13½to14	4c. lb.	
Scrap aluminum, cast, mixed	7½to 9	4c. lb.	
Aluminum borings—turnings	4½to 5	4c. lb.	None.
No. 1 pewter	31 to33	Free	
Electrotype or stereotype	3⅛to 3⅜	2⅛c. lb.*	
Nickel anodes	30 to32	10%	
Nickel clips, new	33 to35	10%	
Monel scrap	11½to16½	10% a.v.	

*On lead content.

Wrought Metals and Alloys

The following are net BASE PRICES per pound, to which must be added extras for size, shape, small quantity, packing, etc., as shown in manufacturers' price lists, effective since August 4, 1933.

COPPER MATERIAL

	Net base per lb.	Duty*
Sheet, hot rolled	17.12½	2½c. lb.
Bare wire, soft, less than carloads	12.25	25% a. v.
Seamless tubing	16.62½	7c. lb.

*Each of the above subject to import tax of 4c. lb. in addition to duty, under Revenue Act of 1932.

NICKEL SILVER

Net base prices per lb. (Duty 30% ad valorem.)

Grade "A" Sheet Metal		Wire and Rod	
10% Quality	23.37½c.	10% Quality	26.25 c.
15% Quality	25.50 c.	15% Quality	30.62½c.
18% Quality	26.75 c.	18% Quality	33.87½c.

BRASS AND BRONZE MATERIAL

Net base prices per pound, mill shipments.

	High Brass	Low Brass	Bronze	Duty	U. S. Import Tax
Sheet	14.75c.	16.00c.	16.37½	4c. lb.	4c. lb on copper content
Wire	14.75c.	16.00c.	16.37½	25%	
Rod	12.25c.	15.75c.	16.12½	4c. lb.	
Angles, channels	22.75c.		24.37½c.	12c. lb.	
Seamless tubing	16.37½c.		18.12½c.	8c. lb.	
Open seam tubing	22.75c.		24.37½c.	20%a.v	No tax.

TOBIN BRONZE AND MUNTZ METAL

(Duty 4c. lb.; import tax 4c. lb. on copper content.)

Net base prices per pound.	
Tobin Bronze Rod	16.00c.
Muntz or Yellow Rectangular and other sheathing	16.87½c.
Muntz or Yellow Metal Rod	13.25c.

ALUMINUM SHEET AND COIL

(Duty 7c. per lb.)

Aluminum sheet, 18 ga., base, ton lots, per lb. 32.80
Aluminum coils, 24 ga., base price, tons lots, per lb.....30.50

ROLLED NICKEL SHEET AND ROD

(Duty 25% ad valorem, plus 10% if cold worked.)

Net Base Prices

Cold Drawn Rods	50c.	Cold Rolled Sheet	60c.
Hot Rolled Rods	45c.	Full Finished Sheet	52c.

MONEL METAL SHEET AND ROD

(Duty 25% ad valorem, plus 10% if cold worked.)

Hot Rolled Rods (base)	35	Full Finished Sheets (base)	42
Cold Drawn Rods (base)	40	Cold Rolled Sheets (base)	50

SILVER SHEET

Rolled sterling silver (December 4) 46.50c. per Troy oz. upward according to quantity. (Duty, 65% ad valorem.)

ZINC AND LEAD SHEET

	Cents per lb. Net Base	Duty
Zinc sheet, carload lots, standard sizes and gauges, at mill, less 7 per cent discount	9.50	2c. lb.
Zinc sheet, full casks (jobbers' price)	9.75	2c. lb.
Zinc sheet, open casks (jobbers' price)	10.50to10.75	2c. lb.
Full Lead Sheet (base price)	7.75	2⅜c. lb.
Cut Lead Sheet (base price)	8.00	2⅜c. lb.

BLOCK TIN, PEWTER AND BRITANNIA SHEET

(Duty free)

This list applies to either block tin or No. 1 Britannia Metal Sheet, No. 23 B. & S. Gauge, 18 inches wide or less; prices are all f. o. b. mill:

500 lbs. or over .....15c. above N. Y. pig tin price
100 to 500 lbs. .....17c. above N. Y. pig tin price
Up to 100 lbs. .....25c. above N. Y. pig tin price

Lighter gauges command "extras" over the above prices.

Supply Prices, December 4, 1933

ANODES

Prices, except silver, are per lb f.o.b., shipping point based on purchases 500 lbs. or more, and are subject to changes due to fluctuating metal markets.

Copper: Cast 17¼c. per lb.
Electrolytic, full size, 13¼c.; cut to size, 13½c. per lb.
Rolled oval, straight, 15¼c.; curved, 16¼c. per lb.
Brass: Cast 16¼c. per lb.
Zinc: Cast 9c. per lb.
Nickel: 90-92% 43c. per lb.
95-97% 44c. per lb.
99% + cast, 46c.; rolled, depolarized, 47c.
Silver: Rolled silver anodes .999 fine were quoted Dec. 4, from 46.50c., per Troy ounce upward, depending upon quantity.

WHITE SPANISH FELT POLISHING WHEELS

Diameter	Thickness	Under 50 lbs.	50 to 100 lbs.	Over 100 lbs.
10-12-14 & 16	1" to 2"	$2.95/lb.	$2.65/lb.	$2.45/lb.
10-12-14 & 16	2 to 3½	2.85	2.55	2.35
6-8 & over 16	1 to 2	3.05	2.75	2.55
6-8 & over 16	2 to 3½	3.00	2.70	2.45
6 to 24	Under ½	4.25	3.95	3.75
6 to 24	½ to 1	3.95	3.65	3.45
6 to 24	Over 3½	3.35	3.05	2.85

Any Quantity

4 to 6	Under ½, $5.00	½-1, $4.85	1 to 3, $4.75
1½ to 4	" 5.55	" 5.40	" 5.35
1 to ½	" 5.85	" 5.70	" 5.60

Extras: 25c per lb. on wheels, 1 to 6 in. diam., over 3 in. thick.
On grey Mexican wheels deduct 10c. per lb. from above prices.

COTTON BUFFS

Full disc open buffs, per 100 sections when purchased in lots of 100 or less were quoted December 1:

14" 20 ply 84/92 Unbleached	$57.30-70.96
11" 20 ply 84/92 Unbleached	39.15-48.48
14" 20 ply 80/92 Unbleached	45.95-56.90
11" 20 ply 80/92 Unbleached	31.50-39.01
14" 20 ply 64/68 Unbleached	38.09-47.17
11" 20 ply 64/68 Unbleached	26.20-32.45
Sewed Pieced Buffs, per lb., bleached	40c. to 1.09

CHEMICALS

These are manufacturers' quantity prices and based on delivery from New York City.

Acetone	lb.	.09-.10½
Acid—Boric (Boracic) granular, 99½+% ton lots	lb.	.04½-.05
Chromic, 75 to 400 lb. drums	lb.	.15-.15¼
Hydrochloric (Muriatic) Tech., 20 deg., carboys	lb.	.02
Hydrochloric, C. P., 20 deg., carboys	lb.	.06
Hydrofluoric, 30%, bbls.	lb.	.08-.12
Nitric, 36 deg., carboys	lb.	.06-.06½
Nitric, 42 deg., carboys	lb.	.07-.08
Sulphuric, 66 deg., carboys	lb.	.02
Alcohol—Butyl	lb.	.095-.11
Denatured drums	gal.	.475-.476
Alum—Lump, barrels	lb.	.03¼-.04
Powdered, barrels	lb.	.03½-.05
Ammonia, aqua, com'l., 26 deg., drums, carboys	lb.	.02¾-.05
Ammonium—Sulphate, tech., bbls.	lb.	.03½-.05
Sulphocyanide, technical crystals	lb.	.42
Arsenic, white, kegs	lb.	.04½-.05
Asphaltum	lb.	.35
Benzol, pure	gal.	.58
Borax, granular, 99½+%, ton lots	lb.	.02¼-.02¾
Cadmium oxide, 50 to 1,000 lbs.	lb.	.55
Calcium Carbonate (Precipitated Chalk)	lb.	.05¾-.07½
Carbon Bisulphide, drums	lb.	.06-.12
Chrome Green, bbls.	lb.	.18¾
Chromic Sulphate	lb.	.33-.55
Copper—Acetate (Verdigris)	lb.	.23
Carbonate, bbls.	lb.	.15-.18
Cyanide (100 lb. kgs.)	lb.	.39
Sulphate, bbls.	lb.	4.45
Cream of Tartar Crystals (Potassium Bitartrate)	lb.	.20¼-.20½
Crocus	lb.	.15
Dextrin	lb.	.05-.08
Emery Flour	lb.	.06
Flint, powdered	ton	$30.00
Fluorspar, bags	lb.	.03½
Gold Chloride	Price subject to gold price fluctuations.	
Gum—Sandarac	lb.	.26
Shellac	lb.	.32-.34
Iron Sulphate (Copperas), bbls.	lb.	.01½
Lacquer Solvents	gal.	85
Lead—Acetate (Sugar of Lead)	lb.	.10-13½
Yellow Oxide (Litharge)	lb.	.12½
Mercury Bichloride (Corrosive Sublimate)	lb.	$1.58
Methanol, 100% synth., drums	gal.	.41½
Nickel—Carbonate, dry, bbls.	lb.	.35-.41
Chloride, bbls.	lb.	.17-.21
Salts, single, 300 and 425 lb. bbls.	lb.	.12-.13
Salts, double, 425 lb. bbls.	lb.	.12-.13
Paraffin	lb.	.05-.06
Phosphorus—Duty free, according to quantity	lb.	.35-.40
Potash Caustic Electrolytic 88-92% broken, drums	lb.	.08-.093
Potassium—Bichromate, casks (crystals)	lb.	.08⅝
Carbonate, 96-98%	lb.	.08¾
Cyanide, 165 lbs. cases, 94-96%	lb.	.57½
Pumice, ground, bbls.	lb.	.02½
Quartz, powdered	ton	$30.00
Rosin, bbls.	lb.	.04½
Rouge—Nickel, 100 lb. lots	lb.	.25
Silver and Gold	lb.	.65
Sal Ammoniac (Ammonium Chloride) in bbls.	lb.	.05-.05½
Silver—Chloride, dry, 100 oz. lots / Cyanide / Nitrate 100 ounce lots	Prices subject to rapid fluctuations of silver market.	
Soda Ash, 58%, bbls.	lb.	.0252
Sodium—Cyanide, 96 to 98%, 100 lbs.	lb.	.16½-.22
Beryllium fluoride ($2NaF.BeF_2$)	lb.	4.30-7.00
Hyposulphite, kegs, bbls.	lb.	.03½-.06½
Metasilicate, granular, bbls.	lb.	3.55-3.70
Nitrate, tech., bbls.	lb.	.03¼-.07
Phosphate, tech., bbls.	lb.	.03¾
Silicate (Water Glass), bbls.	lb	.01½
Stannate, fluctuating	lb.	.40
Sulphocyanide	lb.	.30-.45
Sulphur (Brimstone), bbls.	lb.	.02
Tin Chloride, fluctuating, 100 lb. kegs	lb.	.39
Tripoli, powdered	lb.	.03
Wax—Bees, white, ref. bleached	lb.	.60
Yellow, No. 1	lb.	.45
Whiting, Bolted	lb.	.02½-.06
Zinc—Carbonate, bbls.	lb.	.11
Chloride, drums, bbls.	lb.	.07½-.10
Cyanide (100 lb. kegs)	lb.	.38
Sulphate, bbls.	lb.	.03½

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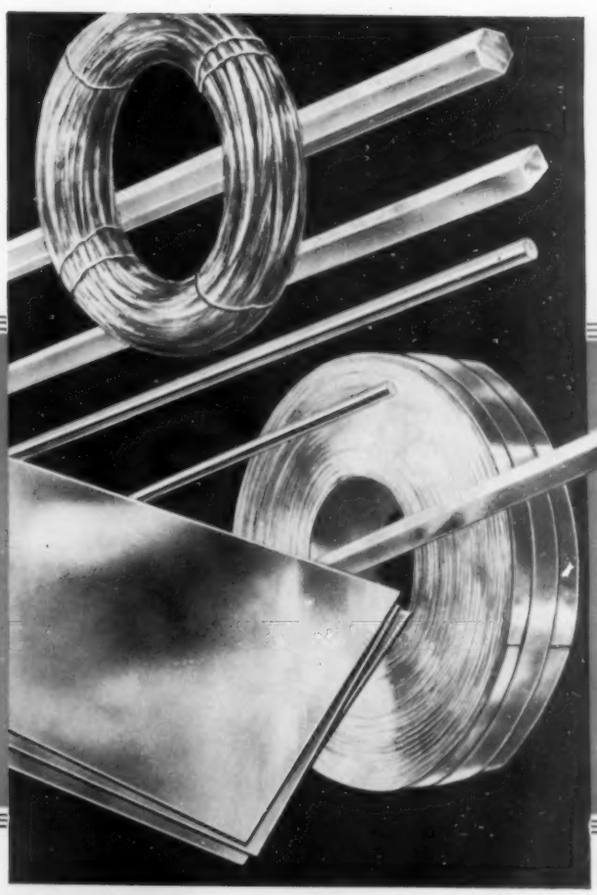
If . . .

YOU USE

NICKEL SILVER



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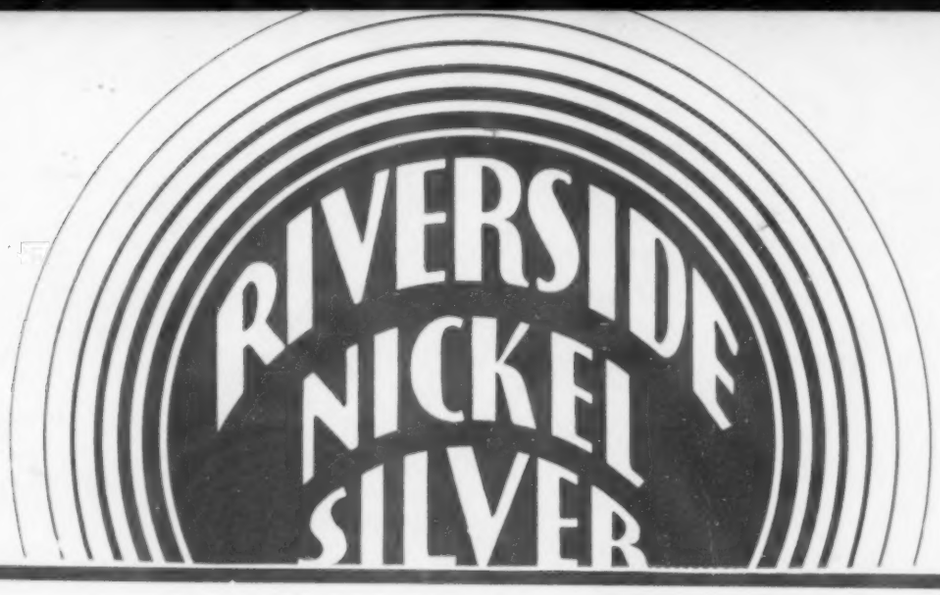

. . . . . These facts about The RIVERSIDE METAL CO. will interest you!

Some knowledge of this Company's background is helpful in order to appreciate fully (a) the exceptional quality of RIVERSIDE Nickel Silver and (b) the high degree of service this organization renders to consumers.

THE INFLUENCE OF BACKGROUND UPON QUALITY. The Riverside Metal Company owes its beginning in 1897 to the desire on the part of the Keystone Watch Case Corporation — then and now the largest manufacturer of its kind in the world — to secure for itself primarily a dependable source of supply for Nickel Silver. Nickel Silver suitable for manufacture into high grade watch cases must conform to standards of quality which are far above ordinary requirements. Methods of production prevailing at that time being inadequate, new methods were evolved enabling this Company to produce a grade of Nickel Silver which established definitely higher standards for (a) inherent quality, (b) freedom from surface or sub-surface defects and (c) absolute order-to-order uniformity of all the physical, chemical and metallurgical characteristics specified by individual consumers. To sum up, the superior quality of RIVERSIDE Nickel Silver is chiefly due to the fact that this Company has specialized in the manufacture of this alloy for more than 36 years. Thus, it has developed production methods and craftsmen capable of producing a higher grade metal.

THE INFLUENCE OF BACKGROUND UPON SERVICE. Although today one of the country's leading producers of Nickel Silver in every variety of sheet, strip, wire, rod, circles and bars, this Company is — by virtue of specialization in its field — a comparatively small organization. For this reason it is able to render a type of service which cannot be equalled by a larger mill. For instance, friendly, personal contact with the principals of this mill is always possible. This means that a RIVERSIDE customer can get an immediate decision regarding any special request which he may make. There is no red tape to untangle. Promises once made are carried out.

SAMPLES AVAILABLE TO CONSUMERS

We will gladly furnish samples of our Nickel Silver so that you may test it for its quality. Our service will subsequently speak for itself.

We have a booklet on the subject of Nickel Silver which treats the subject matter very comprehensively. This booklet is available to consumers.

NRA WE DO OUR PART

THE RIVERSIDE METAL COMPANY

RIVERSIDE, Burlington County, NEW JERSEY

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WITH THE BEST

REVOLVING FURNACE—MOTOR DRIVEN
For Melting Brass, Copper, Aluminum, Gold, Silver and Other Metals and Alloys.

STATIONARY CRUCIBLE FURNACE—
Low Air, Combustion Chamber.

SIMPLEX FURNACE FIG. No. 92
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Works: Curtis Bay, Md.

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NICKEL ANODES

ARE QUALITY PRODUCTS • • •

LEADERS in the Nickel Plating Industry have standardized on McGean Besplate 99% Nickel Anodes — Because

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2. Anode corrosion is excellent
3. Less frequent filtering of solution required

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Genuine Rolled Oval
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Manufactured by

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Metal Finishing Division of

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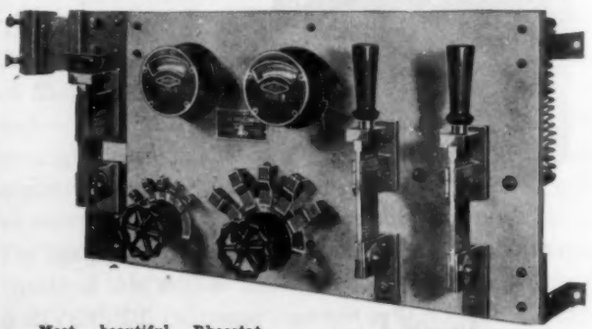
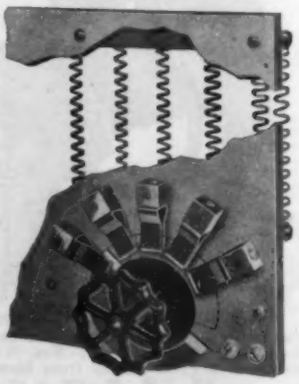
Contrary to unethical propaganda being circulated by some of our competitors, Trojan Imperial Metal Cleaner is guaranteed to contain no Sodium Meta Silicate whatsoever.

TANK RHEOSTATS



Most beautiful Rheostat made. Low in price and highly recommended. Extremely accurate and closely calibrated.

Showing Belke Knife Switch



The Belke Commutating Rheostat replaces a large number of knife switches by using one rotary blade for every five clips. The blade brightens itself as it rotates through the clips, in this manner always presenting a clean surface, assuring perfect contact.

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Belke Rubber Clad Plating Racks have saved hundreds of thousands of dollars for the platers throughout the country during the last few years.

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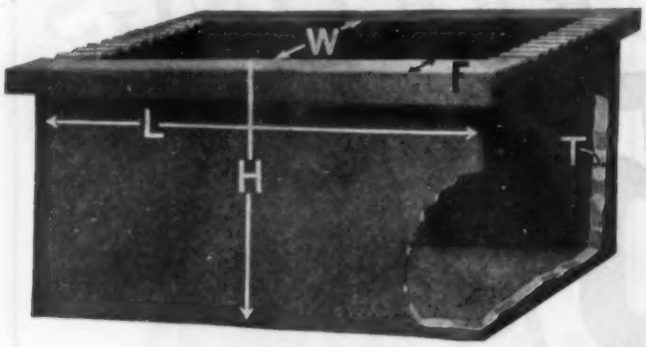

At the left, a standard General Ceramics Chemicalware Tank. Tanks of this general type are made in capacities ranging from 4 to 550 gallons, in standard lengths up to 80 inches and widths and depths up to 40 inches. Special sizes and shapes to order.

General Ceramics Stoneware Equipment includes also piping, valves, pumps, ventilating fans, and other equipment and vessels used for handling corrosive fluids.

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CHEMICAL STONEWARE

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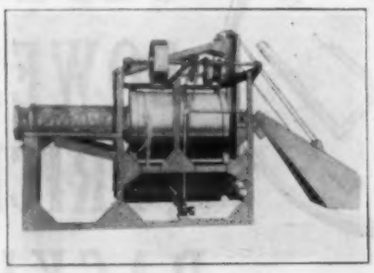
General Ceramics Company, 71 West Thirty-fifth Street, New York, N. Y.



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Maybe you can assure yourself of a profit by using this Ideal Continuous Type Washer. It washes and cleans work in hot compound, deposits it gently on a screen, where it dries of its own heat. Grease and chips are removed from the circulating compound which, always clean, completely submerges the work.

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3. Grade B Lea Compound on 14" pocketed type wheel at 2200 R. P. M.

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Two hard wheel operations and scratch brush operation eliminated.

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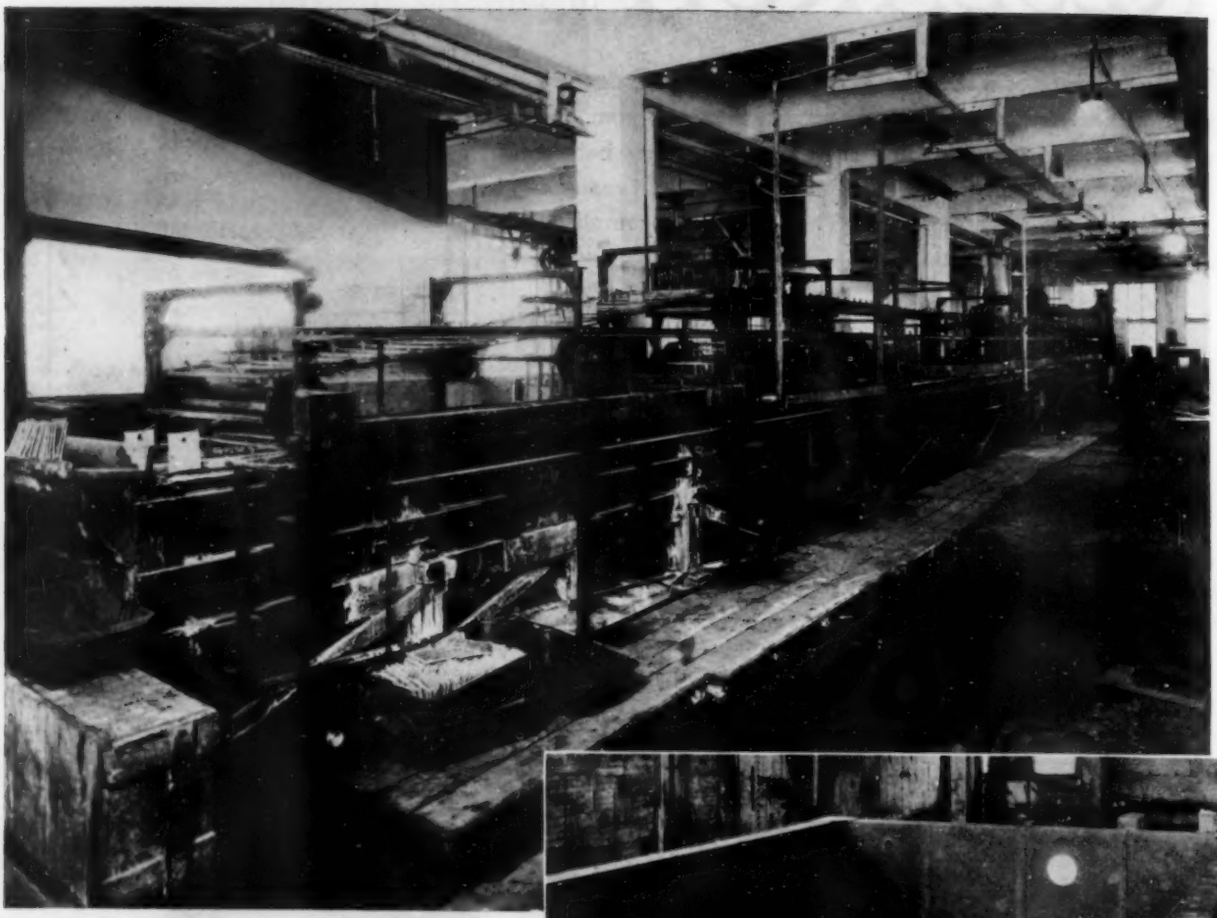

Here is a one-piece tank lined by "U. S." measuring 20 feet and 4 inches in length, 13 feet and 9 inches in width and 5 feet in depth.

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THAT EXTRA
SERVICE

Tanks, Cars, Racks, etc.

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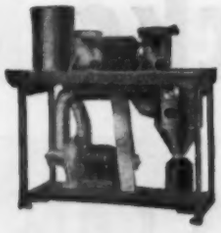
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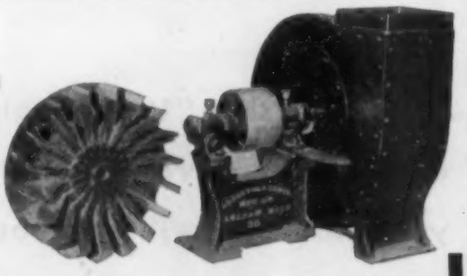

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You are then "set"
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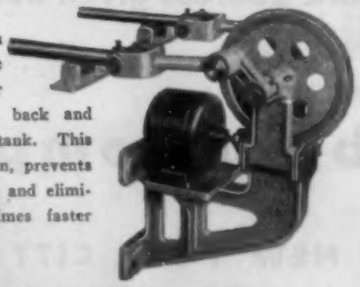

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And also get better protection against rust and stain on exposed metal parts

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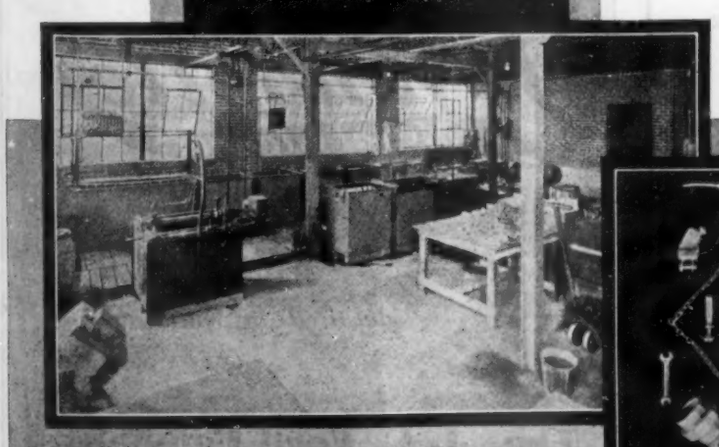

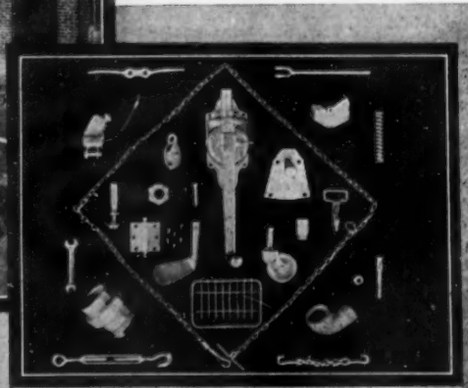

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Once again we pledge ourselves to a continuation of the policy established many years ago and which has met with your generous approval,—not only to supply you with the finest products, but also to render you every possible service and to observe the spirit as well as the letter of fair dealing.

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Clean "Chemically" Clean
Metal Cleaners

Write for detailed information.

The J. B. Ford Company
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QUALITY
CHEMICALS

PLATERS GRADE ANODES AND SALTS

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50 years in business.

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These products have been recently perfected and we believe them to be the best available for the work named:

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New! New! New!—For Polishing

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Or, if you do not wish so much for trial, will send you a liberal sample free. Specify which is wanted, by name and number.

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Lead Linings for Tanks, Vats, etc; Lead Coils; Lead Sleeves; Agitators; Lead, Acid Jugs and Carboys; Acid Waste Line; Lead and Lead Lined Pipe and Fittings; Special Lead Traps and Drain Boxes; Pure Tin Linings for Vessels of Every Character

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Dependable *Moderate Cost*

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★ THE NEW H-VW-M ★

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BURNISHING BARREL

A SELF contained unit, motor driven, easy to load, easy to operate, at any angle and requiring a minimum of floor space — that's the story of the newest addition to the Hanson-Van Winkle-Munning line of plating and finishing equipment and supplies.

This barrel not only saves time — it puts burnishing on a production basis. You can predetermine the exact results and maintain the same quality and quantity of work day after day.

And it's built to Hanson-Van Winkle-Munning Standards. Structural steel and boiler plate, all metal, all welded frame and protected with alkali resistant paint, this barrel will stand up under the heaviest type of service for years. It is made in two sizes and several of these units have been in service for more than a year.

It has many safety features, saves in installation cost and its mechanical features are perfected to the last detail.

Complete specifications, description and photographs will be furnished on request.

★ SPECIFICATIONS ★

Inside	No. 1 Size	No. 2 Size
Dimensions	11⅜" Octagonal	14¼" Octagonal
(after lining)	24" Deep	30" Deep
Floor Space	26½" x 48"	31½" x 56"
Loading Height	44½"	51"
Net Weight	530 lbs.	915 lbs.
Motor	½ H. P.	¾ H. P.

All non-friction bearings.
Cylinder speed about 60 r. p. m.
Cover self aligning.
Timken roller bearings.
Motor switch—Thermal overload protection.
End grain hardwood block lining.
Removable wearing plate in bottom of barrel.

HANSON-VAN WINKLE-MUNNING

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Ⓟ176

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A COMPOUND designed and perfected to successfully establish a chemically clean metal surface.

The true colloidal nature of the base keeps the extractive suspended and dispersed, thereby preventing redeposition.

Details will be gladly furnished regarding superiority of

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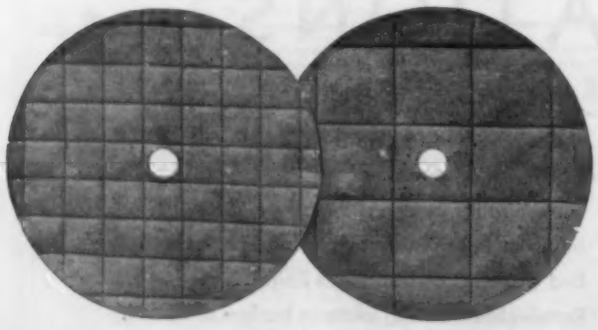

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We are sure all cutlery manufacturers working steel, Cutting down, and Polishing, will find Harrison's No. 1037 Pink and No. 1578 Green good for mirror work. We can supply a cutting down grade for any class of steel.

Get your samples and try them.

A large cutlery manufacturer writes us, "No. 1037 is a beautiful coloring compound."

SOME QUALITY COMPOSITIONS

No. 5 No. 4

4AAAA

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Our Record Goes Back to 1887

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GREEN

LIGHT GREEN

WHITE VELVET

in

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For Buffing All Kinds of Materials.

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Production finishing of small metal parts reaches peak efficiency in the Abbott Burnishing Barrel. The vertical design confines the action to a narrow space so that no burnishing pressure is wasted. Result: a quicker finish.

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Inspect these materials in a free Sample Kit. With it you can determine which shapes will be most efficient in burnishing your parts.

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ON THE FINGERS OF ONE HAND

Count them!

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3. Free rinsing
4. No etching
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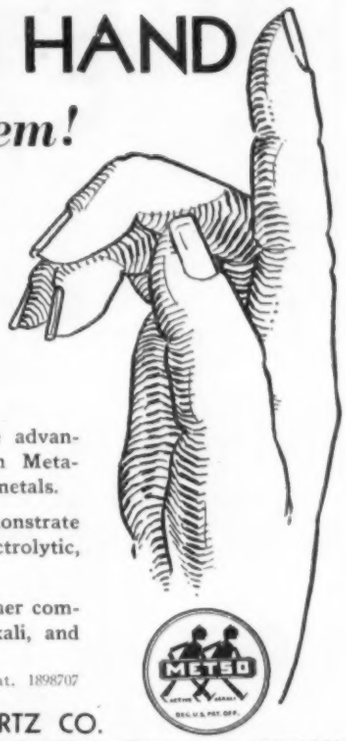

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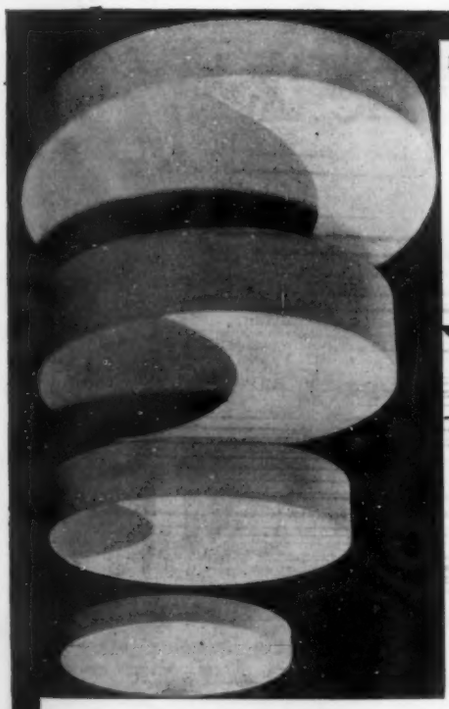

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LEADS—BECAUSE IT'S THE PRODUCT OF LEADERS

COME TO HAMMOND of KALAMAZOO FOR

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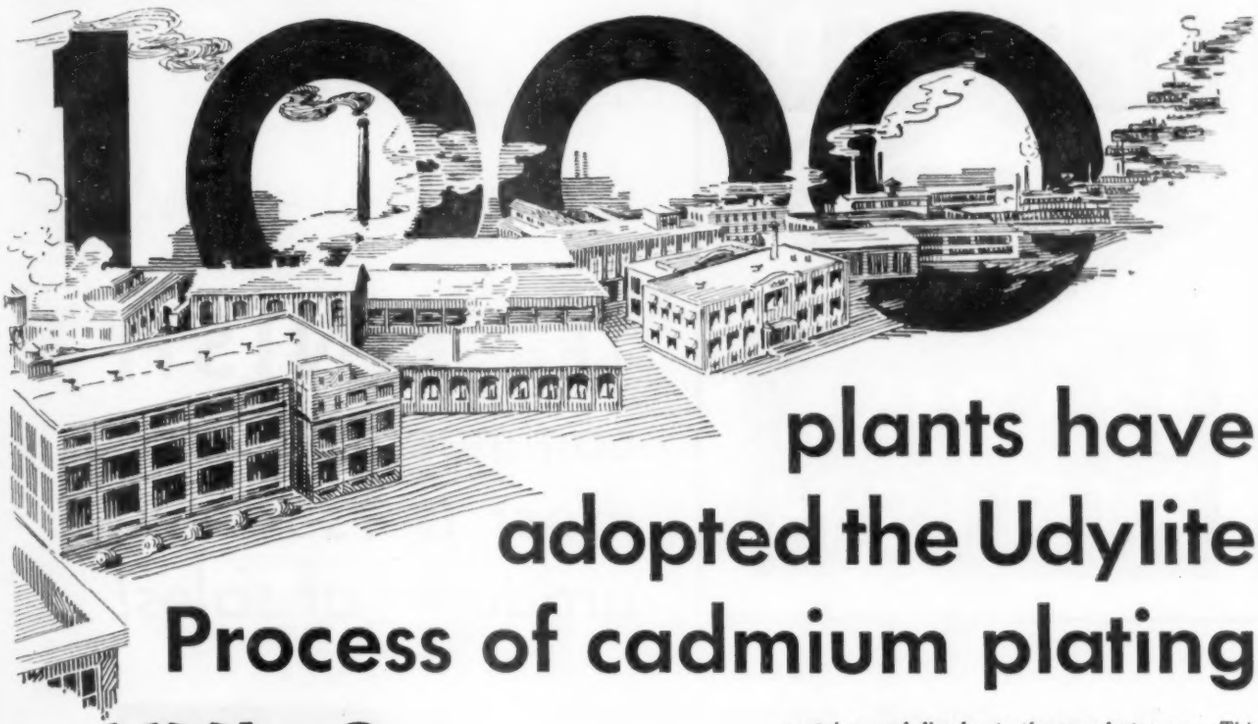

Why?

1 Because the Udylite Process is the most efficient method of depositing cadmium. As pioneers in the field of cadmium plating, the Udylite Process Company has devoted fourteen years to steady improvement of the process until it stands today unrivalled for dependable results, efficiency, ease of control, flexibility and economical operation.

2 Because Udylite solutions are designed to meet any plating speed requirement. Special solutions are operated at current densities as high as 250 amperes per square foot.

3 Because of Udybrite, a constituent of the Udylite bath, which produces lustrous, fine-grained deposits. These deposits are harder and more rust resistant.

4 Because of the stability of the Udylite solution. There is no need of dumping the plating solution after a brief period of use and making up a fresh one. The Udylite bath is a permanent asset. Its basic composition never changes. Solutions purchased twelve years ago are still giving efficient and satisfactory service. This is proof of the remarkable stability of the Udylite solution.

5 Because of the Udylite-Cadmium ball anode which corrodes evenly and provides a constant anode area. As metal is plated out of solution an equivalent amount dissolves from the ball anode thus keeping the metal content at a fixed level. The Udylite bath does not require expensive, prepared salt additions to maintain its metal content.

6 Because of the direct, substantial savings effected through the use of the ball anode. As the balls grow smaller they descend to the bottom of the helical coil container and dissolve to the very last ounce. This eliminates losses in remelting or in otherwise disposing of anode scrap.

7 Because of the guaranteed purity of Udylite materials which ensures constant and dependable results. Udylite salts are composed of ingredients each of which performs an important function. "Filler" salts are not added to attain weight. "Filler" salts raise the viscosity of the solution to such a point that unnecessary and expensive metal losses result through "dragout".

8 Because of the efficiency and simplicity of the Udylite Test Set. It is contained in a small, neatly appointed case. There is no confusing maze of glassware. The Test Set quickly and accurately determines the free cyanide content, the metal content and the amount of metal deposited. Thus, electroplating control is reduced to terms which even the inexperienced operator can understand.

9 Because of the separate service department which the Udylite Process Company maintains for the benefit of its users. Trained engineers, specialists in cadmium plating, periodically visit each Udylite installation to assist the user in maintaining maximum efficiency in his Udylite plant.

10 Because of the research work which is constantly being carried on in the Udylite laboratories to provide Udylite users with technical information on various phases of cadmium plating. Results of investigations are published in the form of bulletins which are available to Udylite users.

11 Because the long association of Udylite engineers with the cadmium plating industry qualifies them extremely well to lay out productive and economical installations.

12 Because the policies of the Udylite Process Company are broad and constructive. Every user is assured complete cooperation and prompt, efficient service. The name "Udylite" is synonymous with dependability.

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ZAPON
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continues to be the most persuasive producer of sales!

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SPRAYED IZARINE . . . relatively a newcomer among the many fine ZAPON finishes . . . has the softness and richness characteristic of suede. It is applied direct to the product by means of the spray gun. The process is so simple that it can be utilized with great profit for an almost unlimited range of articles.

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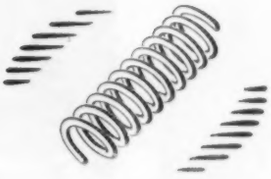
...and now

BERYLLIUM-COPPER

sheets—wire—rods—tubes—forgings



A heat treated Beryllium-Copper coil spring withstood 10,000,000 cycles of deflection without indication of failure—an illustration of the remarkable fatigue limit values obtainable in this alloy.

BERYLLIUM-COPPER is a relatively new alloy being produced commercially by The American Brass Company.

The most notable characteristic of the alloy is the remarkable improvement in physical properties which can be brought about by heat treatment. In the annealed condition, Anaconda Beryllium-Copper wire, for instance, has a tensile strength of about 74,000 p.s.i. and by a correctly selected heat treatment, this tensile strength may be increased to any desired value up to 181,000 p.s.i. Similar increases are achieved in hardness and fatigue limit.

Whether annealed or cold worked, Anaconda Beryllium-Copper can be fabricated by usual methods, after which finished parts may be physically improved by heat treatment.

A copy of Anaconda publication B-21 describing this alloy in more detail and giving general heat treating instructions will be sent upon request.

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SRM Beer Pipe is made of the purest block tin.

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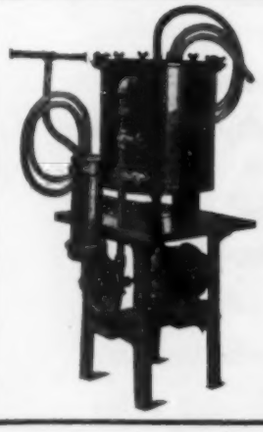

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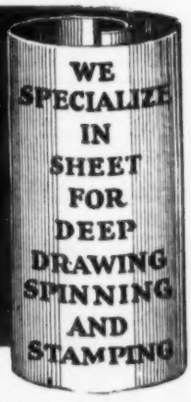

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Any machine can be furnished with direct connected motor drive for AC or DC. Write. Wire. Phone for prices.

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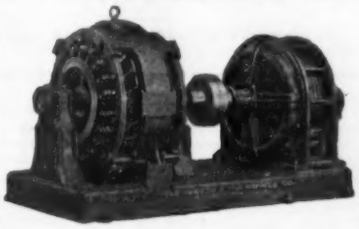
Plating Dynamos and Motor Generator Sets



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HIGHEST PRICES—IMMEDIATE RETURNS

METALLURGICAL PRODUCTS CO.
1227-29 E. Berks St. Philadelphia, Pa.

WANTED NICKEL ANODE Scrap & pieces
Give description and quantities available.
P. O. Box 322 LaSalle, Illinois

WANTED: Buffing lathes, 5 horsepower, A. C., New or Old
BRUST BROS., INC. Telephone, Williamsburgh 5-0563—0564 119 Walton St., Brooklyn, N. Y.

SITUATIONS WANTED

Display Advertisements, One Column Wide, $1 per inch, Each Insertion

FOREMAN PLATER

Situation Wanted—An American foreman plater with years of practical experience, a good character, education and executive background desires to make a permanent connection with a dependable firm, where a progressive and competent man would be appreciated with the proper spirit. To such a concern I would give a sincere whole hearted service and would prefer a moderate compensation to be associated with a firm with above mentioned qualities. I have an intimate technical knowledge of all standard and special finishes, including chromium, cadmium, gold, silver, nickel, black nickel, brass, bronze, copper, zinc and tin plating upon all metals, by the full automatic, semi-automatic, still tank and mechanical barrel processes. Also oxidizing, bronzing, lacquering and ball burnishing, especially efficient in producing and maintaining unusually bright and uniform deposits economically, and use modern methods to produce satisfactory results in the preparation and chemical control of all processes and solutions. Location unimportant. Excellent references submitted. Address

AMERICAN care of METAL INDUSTRY.

SUPERVISOR

SITUATION WANTED—By one who has had years of practical and theoretical experience with organizing and executive ability, would like to correspond with a manufacturer who desires the services of a man familiar and competent in all branches and phases of the business—all metals and finishes—by the automatic-mechanical and still tank processes where supervision and chemical control in the plating and finishing rooms are required. Has chemical and technical training. Details and references promptly submitted. Willing to locate anywhere.

TRAINING
Care of METAL INDUSTRY.

Situation Wanted: Man, experienced Research Chemist, capable of analyzing and maintaining solutions desires position in plating department of large local company. Will serve in any capacity. Age 32: married. Address Chemist care of Metal Industry.

Attention, Chromium Platers

Are you having trouble with your Chrome Work?
I can help you obtain maximum results in a practical way, if necessary, in your own shop (if in the East). I have spent the past six years doing technical and commercial work. I consider my knowledge in this subject above the average: moderate charges.

Chrome Work care of Metal Industry.

Situation Wanted

Position installing or operating galvanizing, tinning or electro-galvanizing plant by man with several years' experience. Will go anywhere and furnish best of references.

Tinning care of Metal Industry

FOREMAN PLATER—POLISHER

Situation Wanted—Foreman Plater & Polisher, 15 years experience, Jobbing and Manufacturing; able to install plant; familiar with all types of Plating Solutions and Production Methods, including Lacquering control solutions by analysis. Production assured.
Best references. **Methods care of Metal Industry.**

Situation Wanted: as Foreman of plating, polishing or lacquering. 23 years experienced on Builders—Piano—Auto, & Ship Hardware. Jewelry, Flat ware, Hollow ware, Electric fixtures. Still or barrel work.

Age 38 years, good health. At present am part owner of chrome plating plant.

Willing to go anywhere, **Ship Hardware care of Metal Industry.**

SITUATION WANTED

as Brass Foundry Foreman. Jobbing and Specialty production and Plumbers Brass.

Plumbers Brass Care of Metal Industry

BUYERS' GUIDE: ADVERTISERS' PRODUCTS

(Advertisers are entitled to one listing for each sixteenth page of space)

To Locate Advertisements of Firms Listed Below Refer to Alphabetical Index Page 36*

ABRASIVES (Also see Emery.)
Artificial
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Emery
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverill, Mass.
Stevens, Inc., Frederic B., Detroit, Mich.

ACID PIPE
American Hard Rubber Co., New York, N. Y.
Belke Mfg. Co., Chicago, Ill.

ACID PROOF PIPE
Resistance, Hard Rubber
Belke Mfg. Co., Chicago, Ill.
The B. F. Goodrich Rubber Co., Akron, Ohio.
U. S. Rubber Co., New York

ACIDITY TESTING APPARATUS
Kocour Company, Chicago, Ill.

ACIDS
Boracic
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.
Chromic
Chas. Cooper & Co., New York.
Grasselli Chemical Co., The, Cleveland, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
McGean Chemical Co., The, Cleveland, Ohio.
Hydrofluoric
General Chemical Co., Philadelphia, Pa.
Harshaw Chemical Co., The, Cleveland, Ohio.
Oil of Vitriol (Sulphuric)
Zapon Co., The, New York, N. Y.

AEROPLANE DOPE
Egyptian Lacquer Mfg. Co., New York.
Zapon Co., The, New York, N. Y.

AGITATORS FOR PLATING SOLUTIONS
Belke Mfg. Co., Chicago, Ill.
Mechanical
Belke Mfg. Co., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

AIR FILTERS
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

ALLOYS (See also Kind Wanted.)
Non-Ferrous
Riverside Metal Co., Riverside, N. J.
Standard Rolling Mills, Inc., Brooklyn, N. Y.
Brass, Bronze, Nickel, Silver
Riverside Metal Co., Riverside, N. J.

ALUMINUM (See Ingots, Sheets, Wire Rods, etc.)
Sheet
Strahs Aluminum Co., New York.

ALUMINUM CLEANER
Magnus Chemical Co., Garwood, N. J.

AMMETERS (See also Electrical Apparatus and Equipment.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Columbia Electric Mfg. Co., Cleveland, Ohio.

AMYL ACETATE
Egyptian Lacquer Mfg. Co., New York.
Maas & Waldstein Co., Newark, N. J.
Zapon Co., The, New York, N. Y.

ANNEALING FURNACES
Electric
Oil or Gas
Monarch Engineering & Mfg. Co., Baltimore, Md.

ANODES
All Metals
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.
Brass and Bronze
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
MacDermid Incorporated, Waterbury, Conn.
McGean Chemical Co., The, Cleveland, Ohio.
Seymour Mfg. Co., Seymour, Conn.
Cadmium
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Grasselli Chemical Co., The, Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.
Udylite Process Co., Detroit, Mich.
Copper
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
MacDermid Incorporated, Waterbury, Conn.
McGean Chemical Co., The, Cleveland, Ohio.
Seymour Mfg. Co., Seymour, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Lead
Harshaw Chemical Co., The, Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Nickel
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
MacDermid Incorporated, Waterbury, Conn.
McGean Chemical Co., The, Cleveland, Ohio.
Seymour Mfg. Co., Seymour, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Udylite Process Co., Detroit, Mich.
Tin
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.
Zinc
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Grasselli Chemical Co., Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
International Chemical Co., Philadelphia, Pa.
McGean Chemical Co., The, Cleveland, Ohio.

AUTOMATIC METAL CLEANING MACHINES
N. Ransohoff, Inc., Cincinnati, Ohio.

AUTOMATIC POLISHING MACHINES
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Hammond Mach. Builders, Inc., Kalamazoo, Mich.

AUTOMATIC WIRE AND SHEET METAL WORKING MACHINERY
Baird Machine Co., Bridgeport, Conn.

BABBITT METAL (See also Bearings.)
Standard Rolling Mills, Inc., Brooklyn, N. Y.

BAKED ENAMEL REMOVERS
Trojan Products & Mfg. Co., Inc., Chicago, Ill.

BALL BURNISHING EQUIPMENT (Also see Burnishing and Polishing Barrels.)
Abbott Ball Co., The, Hartford, Conn.
Baird Machine Co., Bridgeport, Conn.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
N. Ransohoff, Inc., Cincinnati, Ohio.

BASKETS, DIPPING
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

BATH TESTING APPARATUS
Hellige, Inc., New York.

BLAST GATES
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

BLOCK TIN PIPE
Standard Rolling Mills, Inc., Brooklyn, N. Y.

BLOWERS AND BLOW PIPING (See also Exhaust Fans and Heads.)
Allington & Curtis Co., Saginaw, Mich.
Astle, H. J., & Co., Providence, R. I.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.
Monarch Engineering & Mfg. Co., Baltimore, Md.

BLOWERS AND EXHAUSTERS
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

BLOWER SYSTEMS
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

BRASS FINISHERS' SOAP
Magnus Chemical Co., Garwood, N. J.

BRASS MILL PRODUCTS
Baltimore Brass Co., Baltimore, Md.
Riverside Metal Co., Riverside, N. J.
Seymour Mfg. Co., Seymour, Conn.
Western Cartridge Co., East Alton, Ill.

BRASS; SHEET, WIRE, ROD, TUBE (Also see Wire Mill Products, Rods and Bars.)
Sheets; Strip Metals; Tubes; Wire, Etc.)
American Brass Co., Waterbury, Conn.
Bristol Brass Co., Bristol, Conn.
Riverside Metal Co., Riverside, N. J.
Seymour Mfg. Co., Seymour, Conn.
Western Cartridge Co., Alton, Ill.
Waterbury Rolling Mills, Waterbury, Conn

BRIGHTENERS (For Plating Solutions.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.

BRITANNIA METAL
Standard Rolling Mills, Inc., Brooklyn, N. Y.

BRONZE (See Also Anodes; Castings; Forgings; Ingots; Powdered; Rods and Bars; Tubes, Etc.)
Western Cartridge Co., Alton, Ill.
Phosphor, Tobin, Manganese
Riverside Metal Co., Riverside, N. J.

BRONZING LIQUID
Ault & Wiborg Corp., New York.
Egyptian Lacquer Mfg. Co., New York.
Zapon Co., The, Stamford, Conn.

BRUSHES
Hand
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Wheel
Hanson-Van Winkle-Munning Co., Matawan, N. J.

BUFFING COMPOUND CLEANERS
International Chemical Co., Philadelphia, Pa.

BUFFING AND POLISHING COMPOSITION
Beam-Knodel, Inc., New York.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverhill, Mass.
Lea Mfg. Co., Waterbury, Conn.
MacFarland Mfg. Co., New York.
Matchless Metal Polish Co., Chicago, Ill.—Glen Ridge, N. J.

BUFFING AND POLISHING MACHINES
Hammond Mach. Builders, Inc., Kalamazoo, Mich.

BUFFING MACHINES
Electric
Divine Brothers Company, Inc., Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

BUFFING MACHINES, AUTOMATIC (Also see Polishing Lathes and Heads.)
Hammond Mach. Builders, Inc., Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

BUFFING AND POLISHING WHEELS (Also see Buffs.)
Canvas, Cotton, Etc.
Hammond Mach. Builders, Inc., Kalamazoo, Mich.
Eastern Felt Co., Winchester, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lea Mfg. Co., The, Waterbury, Conn.
MacFarland Mfg. Co., New York, N. Y.
Stevens, Inc., Frederic B., Detroit, Mich.
The Matchless Metal Polish Co., Glen Ridge, N. J.
Williamsville Buff Mfg. Co., Danielson, Conn.
Yerges Buff Co., Fremont, Ohio.
Felt
Eastern Felt Co., Winchester, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
MacFarland Mfg. Co., New York.
Yerges Buff Co., Fremont, Ohio.
Leather
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Pressed Leather Wheel Co., Little Falls, N. Y.
Sheepskin
Hanson-Van Winkle-Munning Co., Matawan, N. J.

BUFFS (Also see Buffing and Polishing Wheels.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
MacDermid Incorporated, Waterbury, Conn.
MacFarland Mfg. Co., New York, N. Y.
Stevens, Inc., Frederic B., Detroit, Mich.
Williamsville Buff Mfg. Co., Danielson, Conn.
Yerges Buff Co., Fremont, Ohio.

BUYERS' GUIDE: ADVERTISERS' PRODUCTS

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BUFFS, STAINLESS STEEL
Hanson-Van Winkle-Munning Co., Matawan, N. J.
MacFarland Mfg. Co., New York.
Williamsville Buff Mfg. Co., Danielson, Conn.

BURNERS (Also see Furnaces.)
Air and Gas Pre-Mixing
Monarch Engineering & Mfg. Co., Baltimore, Md.

BURNISHING AND POLISHING BARRELS
Abbott Ball Co., The, Hartford, Conn.
Baird Machine Co., Bridgeport, Conn.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Ransohoff, N., Inc., Cincinnati, Ohio.
Smith-Richardson Co., Attleboro, Mass.
Stevens, Inc., Frederic B., Detroit, Mich.

BURNISHING COMPOUNDS AND CHIPS
(Also see Soap.)
International Chemical Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Trojan Products & Mfg. Co., Inc., Chicago, Ill.

BURNISHING MACHINES
Abbott Ball Co., The, Hartford, Conn.
Baird Machine Co., Bridgeport, Conn.
Smith-Richardson Co., Attleboro, Mass.

CADMIUM
Grasselli Chemical Co., The, Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
McGean Chemical Co., The, Cleveland, Ohio.
Udylite Process Co., Detroit, Mich.

CADMIUM OXIDE
Grasselli Chemical Co., The, Cleveland, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.
Udylite Process Co., Detroit, Mich.

CADMIUM PLATING
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Grasselli Chemical Co., The, Cleveland, Ohio.
Udylite Process Co., Detroit, Mich.

CAUSTIC SODA
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Harshaw Chemical Co., The, Cleveland, Ohio.
International Chemical Co., Philadelphia, Pa.
McGean Chemical Co., The, Cleveland, Ohio.

CHEMICALS, DEALERS IN ALL KINDS
(Also see Kind Wanted.)
Platers
Cooper & Co., Chas., New York.
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.

CHLORIDE
Nickel
Harshaw Chemical Co., The, Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
McGean Chemical Co., The, Cleveland, Ohio.

CHROMIC ACID
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Grasselli Chemical Co., The, Cleveland, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.

CHROMIUM PLATING
Metal & Thermit Corp., New York.

CHROMIUM PLATING PROCESS
United Chromium, Inc., New York.

CHROMIUM PLATING TANKS
American Hard Rubber Co., New York.
Goodrich Rubber Co., B. F., Akron, Ohio.
United States Rubber Co., New York

CHROMIUM PLATING MACHINERY
Hanson-Van Winkle-Munning Co., Matawan, N. J

CHROMIUM PLATING FUMES EXHAUST SYSTEMS
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

CHROMIUM PLATING POLISH
Hanson-Van Winkle-Munning Co., Matawan, N. J
Harrison & Co., Haverhill, Mass.
Lea Mfg. Co., Waterbury, Conn.
Matchless Metal Polish Co., Glen Ridge, N. J.—Chicago.
McAleer Mfg. Co., Detroit, Mich.

CHUCKING MACHINES, AUTOMATIC
Baird Machine Co., Bridgeport, Conn.

CLEANERS, METAL
Ford, J. B., Co., Wyandotte, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
International Chemical Co., Philadelphia, Pa.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Philadelphia Quartz Co., Philadelphia, Pa.
Sulphur Products Co., Greensburg, Pa.
Trojan Products & Mfg. Co., Inc., Chicago, Ill.
Udylite Process Co., Detroit, Mich.

CLEANING APPARATUS, AUTOMATIC METAL (Also see Pickling Machines.)
Ransohoff, N., & Co., Cincinnati, Ohio.

CLEANING COMPOUNDS (See also Fig Cleaner; Pickling Compounds, Whale Oil Soaps.)
Metal
Ford, J. B., Co., Wyandotte, Mich.
Harshaw Chemical Co., The, Cleveland, Ohio.
International Chemical Co., Philadelphia, Pa.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Philadelphia Quartz Co., Philadelphia, Pa.
Stevens, Inc., Frederic B., Detroit, Mich.

CLEANING SYSTEMS
(Vacuum)
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

COCK GRINDERS

COLLECTING SYSTEMS (Dust, Shavings, Sawdust, Dust Metal.)
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

COMPARATOR SETS
Heliigs, Inc., New York.

COMMUTATORS
Belke Mfg. Co., Chicago, Ill.

COMPOSITION METAL (See Castings; Ingot, Etc.)
Greaseless, for Metal Finishing
Lea Mfg. Co., The, Waterbury, Conn.

COMPOSITIONS (See Buffing and Polishing Composition; Flooring Composition.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverhill, Mass.
Lea Mfg. Co., Waterbury, Conn.
MacFarland Mfg. Co., New York.
Matchless Metal Polish Co., Glen Ridge, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.

COMPOUNDS, CUTTING AND GRINDING DRAWINGS, STAMPING
International Chemical Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.

CONVEYING SYSTEMS (Pneumatic Light and Heavy Materials.)
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

COPPER (Also see Anodes; Castings; Ingots, Rods and Bars; Sheets; Smelters and Refiners; Strip Metal; Tubes; Wire, Etc.)
Sheet, Wire, Rod, Tube
American Brass Co., Waterbury, Conn.

COPPER BEARING MATERIAL, BUYERS OF (See Drosses, Residues, Etc.)

COPPER, CARBONATE OF
Cooper, Chas., & Co., New York, N. Y.
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Hanson-Van Winkle-Munning Co., Matawan, N. J
Harshaw Chemical Co., The, Cleveland, Ohio
McGean Chemical Co., The, Cleveland, Ohio.

COPPER-CYANIDE
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Hanson-Van Winkle-Munning Co., Matawan, N. J
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.

CORE MACHINES
Stevens, Inc., Frederic B., Detroit, Mich.

CORE OIL AND COMPOUNDS
Stevens, Inc., Frederic B., Detroit, Mich.

CORE OVEN INSULATION (See Brick Insulating; Insulating Cement; Insulating Oven.)
The Monarch Engineering & Mfg. Co., Baltimore, Md.

CORE OVENS
Coal and Coke
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.
Monarch Engineering & Mfg. Co., Baltimore, Md
Stevens, Inc., Frederic B., Detroit, Mich.

Oil and Gas
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Stevens, Inc., Frederic B., Detroit, Mich.

CRUCIBLES, METAL MELTING
Lava Crucible Co., of Pittsburgh, Pittsburgh, Pa.
Stevens, Inc., Frederic B., Detroit, Mich.

CUPOLETTES
Monarch Eng. & Manufacturing Co., Baltimore, Md.

CUPOLA AND FURNACE, FIRE CLAY AND CEMENT
Monarch Eng. & Mfg. Co., Baltimore, Md.

CUTTING, STRAIGHTENING, FORMING & EXTRUDING MACHINERY
Wire
Baird Machine Co., Bridgeport, Conn.
Strip Metal
Baird Machine Co., Bridgeport, Conn.

CYANIDES
Hanson-Van Winkle-Munning Co., Matawan, N. J.
McGean Chemical Co., The, Cleveland, Ohio.

CYANIDE OF SODIUM
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Grasselli Chemical Co., The, Cleveland, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.

DIPPING BASKETS
Dipping and Plating
Allington & Curtis Co., Saginaw, Mich.
American Hard Rubber Co., New York.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.
United States Rubber Co., New York
Stoneware
General Ceramics Co., New York.

DRYING-OUT MACHINES (See also Centrifugal Dryers and Extractors; Sawdust Drying-Out Boxes.)
Baird Machine Co., Bridgeport, Conn.
Smith-Richardson Co., Attleboro, Mass.
Udylite Process Co., Detroit, Mich.
Automatic
Astle, H. J., & Co., Providence, R. I.

DUST ARRESTORS
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.
Cloth Screen

DUST COLLECTORS AND VENTILATING SYSTEMS (Also see Exhaust Fans and Heads.)
Allington & Curtis Co., Saginaw, Mich.
Astle, H. J., & Co., Providence, R. I.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

DUST COLLECTING OUTFIT, POLISHING
Astle, H. J., & Co., Inc., Providence, R. I.
Allington & Curtis Mfg. Co., The, Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

DYNAMOS, LOW VOLTAGE, PLATING AND GALVANIZING (Also see Electrical Apparatus and Equipment.)
Bogue, Chas. J., Electric Co., New York, N. Y.
Columbia Electric Mfg. Co., Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.
Udylite Process Co., Detroit, Mich.

DYNAMOS, PLATING, USED
M. E. Baker Co., Boston, Mass.
Boston Plating Supply Co., Boston, Mass.
Chandeysson Electric Co., St. Louis, Mo.
Holland, J., Sons, Brooklyn, N. Y.

ELECTRIC OVENS
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

BUYERS' GUIDE: ADVERTISERS' PRODUCTS

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ELECTRICAL APPARATUS AND EQUIPMENT (Also see Ammeters, Rheostats, Switchboards, Transformers, Voltmeters.)
Bogue, Chas. J., Electric Co., New York.
Udylite Process Co., Detroit, Mich.

ELECTRO GALVANIZING EQUIPMENT AND SUPPLIES (See Dynamos; Plating Barrels; Plating Machines, Automatic; Tanks, Etc.)
Hanson-Van Winkle-Munning Co., Matawan, N. J
Udylite Process Co., Detroit, Mich.

ELECTRO PLATING EQUIPMENT AND SUPPLIES (See also Kind Wanted.)
Beam-Knodel, Inc., New York.
Belke Mfg. Co., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Matchless Metal Polish Co., Glen Ridge, N. J.—Chicago.
Stevens, Inc., Frederic B., Detroit, Mich.
Udylite Process Co., Detroit, Mich.

ELECTRO PLATING, JOB & CONTRACT (Also see Polishing and Burnishing; Plating, Barrel Method.)

ELECTRO PLATING BATH TESTING APPARATUS
Hellige, Inc., New York.

ELECTRO PLATING & GALVANIZING BARRELS
Beam-Knodel, Inc., New York.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.

ELECTRO PLATING TANKS
American Hard Rubber Co., New York.
General Ceramics Co., New York.
Goodrich Rubber Co., B. F., Akron, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
United States Rubber Co., New York
U. S. Stoneware Co., New York.

ELECTROTYPING EQUIPMENT & SUPPLIES
Hanson-Van Winkle-Munning Co., Matawan, N. J.

EMERY (Also see Abrasives.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
MacFarland Mfg. Co., New York.
Stevens, Inc., Frederic B., Detroit, Mich.

EMERY PASTE
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverhill, Mass.
Matchless Metal Polish Co., Glen Ridge, N. J.—Chicago.

ENAMELS
Colored
Agate Lacquer Co., Long Island City, N. Y.
Ault & Wiborg Corp., New York.
Egyptian Lacquer Mfg. Co., New York.
Maas & Waldstein Co., Newark, N. J.
Zapon, The, Co., Stamford, Conn.

Lacquer
Agate Lacquer Co., Long Island City, N. Y.
Ault & Wiborg Corp., New York.
Egyptian Lacquer Mfg. Co., New York.
Maas & Waldstein Co., Newark, N. J.
Zapon, The, Co., Stamford, Conn.

Wood
Agate Lacquer Co., Long Island City, N. Y.
Ault & Wiborg Corp., New York.
Egyptian Lacquer Mfg. Co., New York.
Maas & Waldstein Co., Newark, N. J.
Zapon, The, Co., Stamford, Conn.

ENGINEERS
Consulting Chemists
International Chemical Co., Philadelphia, Pa.
Furnace
Monarch Engineering & Mfg. Co., Baltimore, Md.

EQUIPMENT
Chromium Plating
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.
Electro Plating
Hanson-Van Winkle-Munning Co., Matawan, N. J.

ETHYL ACETATE
Zapon Co., The, Stamford, Conn.

EXHAUST SYSTEMS
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

EXTRUDED SHAPES
Brass, Copper and Bronze

FANS (Exhaust.)
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

FEEDERS (Furnace, Wood Waste.)
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

FELT, POLISHING
Bacon Felt Co., Winchester, Mass.
Eastern Felt Co., Winchester, Mass.

FELT POLISHING WHEELS
Bacon Felt Co., Winchester, Mass.
Eastern Felt Co., Winchester, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
MacFarland Mfg. Co., New York, N. Y.

FELT SHEETS
Bacon Felt Co., Winchester, Mass.
Eastern Felt Co., Winchester, Mass.
MacFarland Mfg. Co., New York, N. Y.

FELT WHEELS
Bacon Felt Co., Winchester, Mass.
Eastern Felt Co., Winchester, Mass.
MacFarland Mfg. Co., New York, N. Y.

FIG CLEANERS (Also see Cleaning Compounds, Whale Oil Soap.)
International Chemical Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.

FILTER AERATING & AGITATING SYSTEM
Belke Mfg. Co., Chicago, Ill.

FILTER SYSTEM FOR PLATING SOLUTIONS
Belke Mfg. Co., Chicago, Ill.

FILTER, TANK
Belke Mfg. Co., Chicago, Ill.

FIRE CEMENT
Lava Crucible Co., of Pittsburgh, Pittsburgh, Pa.
Monarch Eng. & Mfg. Co., Baltimore, Md.

FLUXES
Brazing, Soldering, Tinning and Welding
Grasselli Chemical Co., The, Cleveland, Ohio.

FOIL
Tin, Lead & Electrotypers
Standard Rolling Mills, Inc., Brooklyn, N. Y.

FOUNDRY FACINGS
Stevens, Inc., Frederic B., Detroit, Mich.

FURNACE STOKERS
Refuse and Wood Fuel
Allington & Curtis Mfg. Co., The, Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

FURNACES (See Annealing Furnaces; Burners; Electric Furnaces; Galvanizing & Tinning Furnaces; Heat Treating Furnaces; Melting Furnaces; Powdered Coal Burning Furnaces; Sherardizing Furnaces; Smelting Furnaces.)
Fisher, Alfred, Furnace Co., Cicero, Ill.
Monarch Engineering & Mfg. Co., Baltimore, Md.

FURNACE TILE AND LININGS (Also see Fire Brick.)
Monarch Engineering & Mfg. Co., Baltimore, Md.

FUSE METAL
Platt Bros. & Co., Waterbury, Conn.

GALVANIZING AND TINNING FURNACES (Also see Burners.)
Monarch Engineering & Mfg. Co., Baltimore, Md.

GALVANIZING EQUIPMENT AND SUPPLIES (See Kinds Wanted. Also Plating Galvanizing Machines. Automatic; Hot and Galvanizing Barrels; Plating and Galvanizing and Tinning Equipment.)
Hanson-Van Winkle-Munning Co., Matawan, N. J
Udylite Process Co., Detroit, Mich.

GENERATORS (See Dynamos; Motor-Generator Sets.)
Beam-Knodel, Inc., New York.
Bogue Electric Co., Chas. J., Hoboken, N. J.
Chandeysson Electric Co., St. Louis, Mo.
Columbia Electric Mfg. Co., Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J
Stevens, Inc., Frederic B., Detroit, Mich.
Udylite Process Co., Detroit, Mich.

GLIDING METAL
Riverside Metal Co., Riverside, N. J.

GLUE FOR POLISHING
Hanson-Van Winkle-Munning Co., Matawan, N. J.

GLUE HEATERS AND POTS
Divine Bros. Co., Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

GOLD (See Anodes; Bars; Metal Dealers; Smelters and Refiners.)

GRAPHITE PRODUCTS, POSPHORIZERS, STIRRERS, ETC. (Also see Crucibles.)
Lava Crucible Co., Pittsburgh, Pa.

GREASELESS COMPOSITIONS
Lea Mfg. Co., The, Waterbury, Conn.
The Matchless Metal Polish Co., Glen Ridge, N. J.

GRINDERS & BUFFERS
Electric
Hammond Mach. Builders, Inc., Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

GRINDING COMPOUNDS
International Chemical Co., Philadelphia, Pa.

GRINDING MACHINES
Hammond Mach. Builders, Inc., Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.
Electric
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Portable

HARD RUBBER FITTINGS
American Hard Rubber Co., New York.
Udylite Process Co., Detroit, Mich.
Pipe
Belke Mfg. Co., Chicago, Ill.
Udylite Process Co., Detroit, Mich.
Hard Rubber Tanks
American Hard Rubber Co., New York.
Goodrich Rubber Co., B. F., Akron, Ohio.
United States Rubber Co., New York

HOODS (Also see Dust Collectors and Ventilating Systems.)
Allington & Curtis Mfg. Co., The, Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio

HYDROGEN ION CONTROL APPARATUS
Hellige, Inc., New York.

HYDROGEN PEROXIDE
McGean Chemical Co., The, Cleveland, Ohio.

INGOTS (Also see Calcium-Copper; Manganese-Copper; Phosphor-Copper; Phosphor-Tin; Silicon-Copper; Smelters and Refiners.)
Aluminum
Strahs Aluminum Co., New York.

INSTRUMENTS (Testing)
Thwing Instrument Co., Phila., Pa.

INSULATION (Also see Brick, Insulating. Insulating Cement.)
Pipe
American Hard Rubber Co., New York, N. Y.
Goodrich Rubber Co., B. F., Akron, Ohio
United States Rubber Co., New York

JAPAN REMOVERS
International Chemical Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J
Trojan Products & Mfg. Co., Inc., Chicago, Ill.

JAPANS, ALL KINDS
Zapon Co., The, Stamford, Conn.

JEWELERS' EQUIPMENT (Also see Kind Wanted.)
Smith-Richardson Co., Attleboro, Mass.

LACQUER ENAMELS (See Enamels.)
Zapon, The, Co., Stamford, Conn.

LACQUERS
Colored
Agate Lacquer Co., Long Island City, N. Y.
Ault & Wiborg Corp., New York
Egyptian Lacquer Mfg. Co., New York.
Maas & Waldstein Co., Newark, N. J.
Roxalin Flexible Lacquer Co., Inc., Long Island City, N. Y.
Zapon, The, Co., Stamford, Conn.
For Incandescent Lamps
Zapon, The, Co., Stamford, Conn.
Metal
Agate Lacquer Co., Long Island City, N. Y
Ault & Wiborg Corp., New York
Egyptian Lacquer Mfg. Co., New York.
Maas & Waldstein Co., Newark, N. J.
Roxalin Flexible Lacquer Co., Inc., Long Island City, N. Y.
Zapon, The, Co., Stamford, Conn.
Wood
Agate Lacquer Co., Long Island City, N. Y.
Ault & Wiborg Corp., New York
Egyptian Lacquer Mfg. Co., New York.
Zapon, The, Co., Stamford, Conn.

LACQUER REMOVERS
Egyptian Lacquer Mfg. Co., New York.
International Chemical Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Trojan Products & Mfg. Co., Inc., Chicago, Ill.
Zapon, The, Co., Stamford, Conn.

LADLE HEATERS AND DRYERS
Monarch Engineering & Mfg. Co., Baltimore, Md

BUYERS' GUIDE: ADVERTISERS' PRODUCTS

(Advertisers are entitled to one listing for each sixteenth page of space)

To Locate Advertisements of Firms Listed Below Refer to Alphabetical Index Page 36*

LATHES (See also Polishing Lathes.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Electric Polishing
Hanson-Van Winkle-Munning Co., Matawan, N. J.

LEAD BURNING
Abernethy, John F., & Co., Inc., Brooklyn, N. Y.

LUBRICANTS, Cutting and Grinding, Drawing, Stamping
International Chemical Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.

MACHINERY
Cleaning Metal (Mech.)
N. Ransohoff, Inc., Cincinnati, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.
Dry Metal (Mech.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.
Metal Drying
Ransohoff, N., Co., Inc., Cincinnati, Ohio.
Pickling Metal (Mech.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
N Ransohoff, Inc., Cincinnati, Ohio.
Galvanizing (Mechanical)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.
Plating (Mechanical)
Hanson-Van Winkle-Munning Co., Matawan, N. J.

MANGANESE-COPPER (Also see Ingots.)
Metal & Thermit Corp., New York.

MANTLE DIP
Zapon Co., The, Stamford, Conn.

MELTING FURNACES (Also see Burners; Galvanizing and Tinning Furnaces; Tank Furnaces.)
Coal and Coke
Monarch Engineering & Mfg. Co., Baltimore, Md.
Oil or Gas
Monarch Engineering & Mfg. Co., Baltimore, Md.
Pit
Monarch Engineering & Mfg. Co., Baltimore, Md.
Stevens, Inc., Frederic B., Detroit, Mich.
Reverberatory
Monarch Engineering & Mfg. Co., Baltimore, Md.

METAL CLEANERS (See also Cleaning Compounds.)
Ford, J. B., Co., Wyandotte, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
International Chemical Co., Philadelphia, Pa.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Philadelphia Quartz Co., Philadelphia, Pa.
Sulphur Products Co., Greensburg, Pa.
Udylite Process Co., Detroit, Mich.

METAL DEALERS (Also see Drosses, Residues, Etc., Buyers of; Turnings, Chips, Anodes, Etc., Buyers of.)
Gold, Silver, Platinum
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Metallurgical Products Co., Philadelphia, Pa.
Radnai, Josef, New York.
Rare Metals
Radnai, Josef, New York.

METAL DRYERS, CENTRIFUGAL
Ransohoff, N., Inc., Cincinnati, Ohio.

METAL POLISH
Harrison & Co., Haverhill, Mass.
International Chemical Co., Philadelphia, Pa.
Lea Mfg. Co., Waterbury, Conn.
Matchless Metal Polish Co., Chicago, Ill.—Glen Ridge, N. J.

METALS (See also Kinds Wanted. Also Metal Dealers.)
Acid Resistant
Riverside Metal Co., Riverside, N. J.

MOLD DRYERS, PORTABLE
Monarch Engineering & Mfg. Co., Baltimore, Md.

MOLDS (See also Mold Makers.)
Babbitt and Solder
Schweitzer, Chas. K., St. Louis, Mo.
Ingot
Schweitzer, Chas. K., St. Louis, Mo.

MONEL METAL POLISH
International Chemical Co., Philadelphia, Pa.

MOTORS (Also see Electrical Apparatus and Equipment.)
Electric
Columbia Electric Mfg. Co., Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

MOTOR-GENERATOR SETS (Also see Dynamos; Electrical Apparatus and Equipment.)
Chandeysson Electric Co., St. Louis, Mo.
Columbia Electric Mfg. Co., Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.
Udylite Process Co., Detroit, Mich.
Plating and Galvanizing
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.

MUNTZ METAL (See Sheets.)

MUSIC ENGRAVERS' PLATES
Standard Rolling Mills, Inc., Brooklyn, N. Y.

NICKEL CARBONATE, MOIST AND DRY
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.

NICKEL CHLORIDE
Cooper & Co., Chas., New York.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.

NICKEL DETERMINATION APPARATUS
Heilige, Inc., New York.

NICKEL SALTS
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.
MacDermid, Inc., Waterbury, Conn.
McGean Chemical Co., The, Cleveland, Ohio.
Stevens, Frederic B., Detroit, Mich.

NICKEL SHOT
Seymour Mfg. Co., Seymour, Conn.

NICKEL SILVER (See also Brass, Sheets, Wire, Rod, Tube Castings; Forgings, Sheets; etc.)
Riverside Metal Co., Riverside, N. J.
Western Cartridge Co., Alton, Ill.
Sheets, Wire, Rod, Tube
Riverside Metal Co., Riverside, N. J.
Seymour Mfg. Co., Seymour, Conn.
Waterbury Rolling Mills, Waterbury, Conn.

NICKEL SULPHATE, SINGLE AND DOUBLE
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio.

OIL BURNERS (See Burners.)
Monarch Eng. & Manufacturing Co., Baltimore, Md.

OIL PUMPS (See also Oil Storage Systems.)
Monarch Engineering & Mfg. Co., Baltimore, Md.

OPTICAL BRONZE
Riverside Metal Co., Riverside, N. J.

OVENS (Also see Burners; also Core Ovens.) Enameling, Lacquering, Japanning
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.
Monarch Eng. & Manufacturing Co., Baltimore, Md.

OXIDIZING SOLUTIONS
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Sulphur Products Co., Greensburg, Pa.

PEWTER
Standard Rolling Mills, Inc., Brooklyn, N. Y.

PHOSPHOR BRONZE (See also Ingots.)
Riverside Metal Co., Riverside, N. J.
Western Cartridge Co., Alton, Ill.

PHOSPHORUS
General Chemical Co., Philadelphia, Pa.

PICKLING TANKS
American Hard Rubber Co., New York, N. Y.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

PIPE AND FITTINGS
Acid Proof, Hard Rubber.
American Hard Rubber Co., New York
Goodrich Rubber Co., B. F., Akron, Ohio
United States Rubber Co., New York

PLATED AND POLISHED SHEET METALS (See also Sheets.)
American Nickeloid Co., Peru, Ill.

PLATERS' BUCKETS, DIPPERS & PITCHERS
Belke Mfg. Co., Chicago, Ill.

PLATER CHEMICAL SAND ACIDS
International Chemical Co., Philadelphia, Pa.

PLATERS METAL
Riverside Metal Co., Riverside, N. J.

PLATERS' SUPPLIES
Beam-Knodel, Inc., New York.
Belke Mfg. Co., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.

PLATING
Cadmium
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Grasselli Chemical Co., The, Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.

PLATING BARRELS, ROTARY
Belke Mfg. Co., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.
Udylite Process Co., Detroit, Mich.

PLATING AND GALVANIZING BARRELS
Belke Mfg. Co., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.

PLATING AND GALVANIZING MACHINES, AUTOMATIC (Also see Plating Barrels.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.

PLATING EQUIPMENT AND SUPPLIES (See also Kind Wanted.)
Belke Mfg. Co., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.

PLATING GENERATORS
Bogue Electric Co., Chas. J., Hoboken, N. J.
Chandeysson Electric Co., St. Louis, Mo.
Columbia Electric Mfg. Co., Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Holland, J., & Sons, Brooklyn, N. Y.
Pan Electric Mfg. Co., St. Louis, Mo.
Stevens, Inc., Frederic B., Detroit, Mich.
Udylite Process Co., Detroit, Mich.

PLATING MATERIALS
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.
Stevens, Inc., Frederic B., Detroit, Mich.
Udylite Process Co., Detroit, Mich.

PLATING RACKS
American Hard Rubber Co., New York.
Belke Mfg. Co., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

PLATING SOLUTION AGITATOR
Belke Mfg. Co., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

PLATING SOLUTION FILTER SYSTEM
Belke Mfg. Co., Chicago, Ill.

PLATING SOLUTION TESTERS
Heilige, Inc., New York.

PLATING TANKS
American Hard Rubber Co., New York, N. Y.
Udylite Process Co., Detroit, Mich.
Goodrich Rubber Co., B. F., Akron, Ohio.
United States Rubber Co., New York

PNEUMATIC CONVEYORS
Bulk Materials
Allington & Curtis Mfg. Co., The, Saginaw, Mich.

POLISHERS, FLOOR AND BENCH
Astle, H. J., & Co., Providence, R. I.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.

POLISHING ABRASIVES
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverhill, Mass.
MacFarland Mfg. Co., New York.

POLISHING BENCHES
Divine Brothers Company, Inc., Utica, N. Y.

BUYERS' GUIDE: ADVERTISERS' PRODUCTS

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POLISHING COMPOSITIONS (See Buffing and Polishing Compositions.)
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverhill, Mass.
Lea Mfg. Co., The, Waterbury, Conn.
MacFarland Mfg. Co., New York.
Matchless Metal Polish Co., Glen Ridge, N. J.—Chicago.
Stevens, Inc., Frederic B., Detroit, Mich.

POLISHING EQUIPMENT AND SUPPLIES (See also Kinds Wanted.)
Beam-Knodel, Inc., New York.
Divine Brothers Company, Inc., Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.

Used
Baker, M. E. Co., The, Boston, Mass.

POLISHING FELTS
Eastern Felt Co., Winchester, Mass.
MacFarland Mfg. Co., New York.

POLISHING LATHES AND HEADS
Electric
Hammond Mach. Builders, Inc., Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.

POLISHING MACHINES (Also see Polishing Lathes and Heads.)
Automatic
Hammond Mach. Builders, Inc., Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Stevens, Inc., Frederic B., Detroit, Mich.

POLISHING MATERIALS
Beam-Knodel, Inc., New York.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverhill, Mass.
Lea Mfg. Co., Waterbury, Conn.
Matchless Metal Polish Co., Glen Ridge, N. J.—Chicago.
MacFarland Mfg. Co., New York.

POLISHING WHEELS (See also Buffing and Polishing Wheels.)
Divine Brothers Company, Inc., Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
MacFarland Mfg. Co., New York.
The Matchless Metal Polish Co., Glen Ridge, N. J.
Yerges Buff Co., Toledo, Ohio.

POTASH
First Sorts
Harshaw Chemical Co., The, Cleveland, Ohio.
Real
Harshaw Chemical Co., The, Cleveland, Ohio.

POTASSIUM CYANIDE
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Harshaw Chemical Co., The, Cleveland, Ohio.
Udylite Process Co., Detroit, Mich.

PRESSES (Also see Scrap Baling Machine.)
Bench and Foot
Baird Machine Co., Bridgeport, Conn.
Power, All Types
Baird Machine Co., Bridgeport, Conn.

PROCESS (CHROMIUM)
United Chromium, Inc., New York.

PUMPS
Hard Rubber. Acid Proof
American Hard Rubber Co., New York.
Goodrich Rubber Co., B. F., Akron, Ohio
United States Rubber Co., New York.

PYROMETERS—For Brass and Aluminum
Thwing Instrument Co., Phila., Pa.

RACKS—Rubber Covering for
American Hard Rubber Co., New York.
Belke Mfg. Co., Chicago, Ill.
Goodrich Rubber Co., B. F., Akron, Ohio.
United States Rubber Co., New York
Plating
Belke Mfg. Co., Chicago, Ill.

RHEOSTATS (See also Electrical Apparatus and Equipment.)
Beam-Knodel, Inc., New York.
Belke Mfg. Co., Chicago, Ill.
Columbia Electric Mfg. Co., Cleveland, Ohio.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylite Process Co., Detroit, Mich.

RHODIUM (Inquire)
Metal Industry, New York, N. Y

RODS AND BARS (Also see Brass Mill Products.)
Aluminum
Straha Aluminum Co., New York.

ROUGE (See also Buffing and Polishing Compositions.)
Harrison & Co., Haverhill, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
MacFarland Mfg. Co., New York.
Matchless Metal Polish Co., Glen Ridge, N. J.—Chicago.

RUBBER TANKS
American Hard Rubber Co., New York.
Goodrich Rubber Co., B. F., Akron, Ohio.
United States Rubber Co., New York.
Belke Mfg. Co., Chicago, Ill.

RUST PREVENTATIVES
International Chemical Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.

RUST PROOF PROCESS
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Udylite Process Co., Detroit, Mich.

RUST REMOVERS
International Chemical Co., Philadelphia, Pa.
Trojan Products & Mfg. Co., Inc., Chicago, Ill.

SAND BLASTS (Inquire)
Cabinet
Astle, H. J., & Co., Providence, R. I.
Leiman Bros., Newark, N. J.

SAWDUST DRYING-OUT BOXES (Also see Drying-Out Machines.)
Ransohoff, N., Inc., Cincinnati, Ohio.
Smith-Richardson Co., Attleboro, Mass.

SHEEPSKIN POLISHING WHEELS
Hanson-Van Winkle-Munning Co., Matawan, N. J.
MacFarland Mfg. Co., New York.

SHEET FELT
Eastern Felt Co., Winchester, Mass.
MacFarland Mfg. Co., New York.

SHEET LEAD
Standard Rolling Mills, Inc., Brooklyn, N. Y.

SHEET METAL WORK
Allington & Curtis Co., Saginaw, Mich.
Kirk & Blum Mfg. Co., Cincinnati, Ohio.

SHEETS (Also see Brass Mill Products; Strip Metal.)
Aluminum
Straha Aluminum Co., New York.
Brass, Copper and Nickel-Silver
Bristol Brass Co., Bristol, Conn.
Riverside Metal Co., Riverside, N. J.
Seymour Mfg. Co., Seymour, Conn.
Waterbury Rolling Mills, Waterbury, Conn.
Western Cartridge Co., East Alton, Ill.
Bronze
Riverside Metal Co., Riverside, N. J.
Copper
Nickel-Silver
Riverside Metal Co., Riverside, N. J.
Seymour Mfg. Co., Seymour, Conn.
Waterbury Rolling Mills, Waterbury, Conn.
Plated and Polished
American Nickeloid Co., Peru, Ill.
Silver, Sterling
Handy & Harman Co., New York.
Zinc
Matthiesen & Hegeler Zinc Co., La Salle, Ill

SHERARDIZING
Grasselli Chemical Co., The, Cleveland, Ohio.

SILVER ANODES
Handy & Harman, New York.

SILVER CHLORIDE
Cooper, Chas., & Co., New York, N. Y.

SILVER CYANIDE
du Pont de Nemours & Co., E. I., Inc., The R. & H. Chemicals Dept., Wilmington, Del.
Udylite Process Co., Detroit, Mich.

SILVER AND GOLD
Handy & Harman, New York.

SILVER SOLDER
Handy & Harman, New York.

SILVER, STERLING
Handy & Harman, New York.

SLAB ZINC
Grasselli Chemical Co., The, Cleveland, Ohio.
Hegeler Zinc Co., Danville, Ill.
Matthiesen & Hegeler Zinc Co., La Salle, Ill.

SOAP AND SOAP CHIPS
International Chemical Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.

SODIUM CYANIDE
Grasselli Chemical Co., The, Cleveland, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
McGean Chemical Co., The, Cleveland, Ohio.
Roessler & Hasslacher Chemical Co., New York

SOLDER
All Kinds
Standard Rolling Mills, Inc., Brooklyn, N. Y.

SOLUTION FILTER SYSTEM
Belke Mfg. Co., Chicago, Ill.

SOLUTION TESTERS
Heilige, Inc., New York.

SOLVENTS
Egyptian Lacquer Mfg. Co., New York.
Maas & Waldstein Co., Newark, N. J.
Zapon Co., The, Stamford, Conn.

SPRAY BOOTHS
Allington & Curtis Mfg. Co., The, Saginaw, Mich.
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UNITED CHROMIUM
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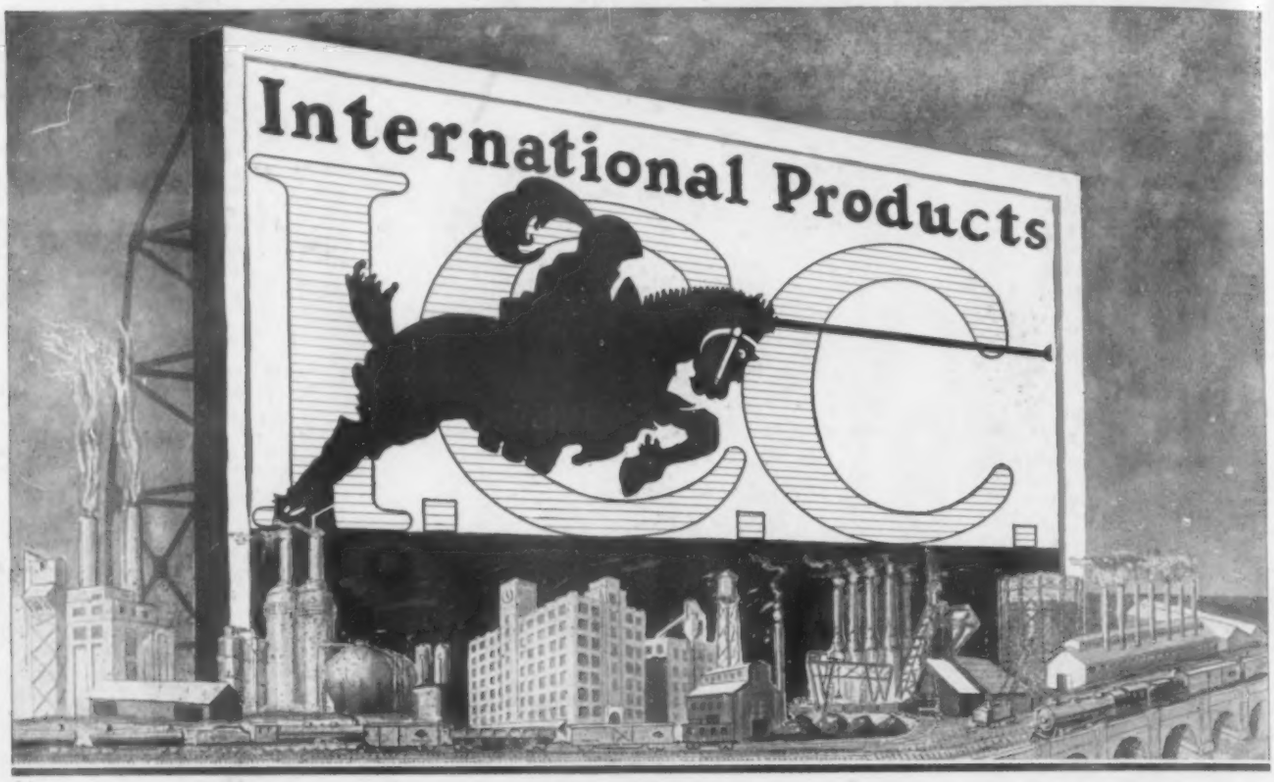

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INTERNATIONAL CHEMICAL CO., Inc.
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